

Service Manual

PIONEER



The photo shows the model KEH-8020/ES

**ORDER NO.
CRT 1052**

CASSETTE CAR STEREO WITH FM/MW/LW ELECTRONIC TUNER

KEH-8030SDK

WG

KEH-8030

EW

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KEH-8020

US, CS, ES

Note:

- See the separate manual CRT-468 for the cassette mechanism Assy (CX-156/A).

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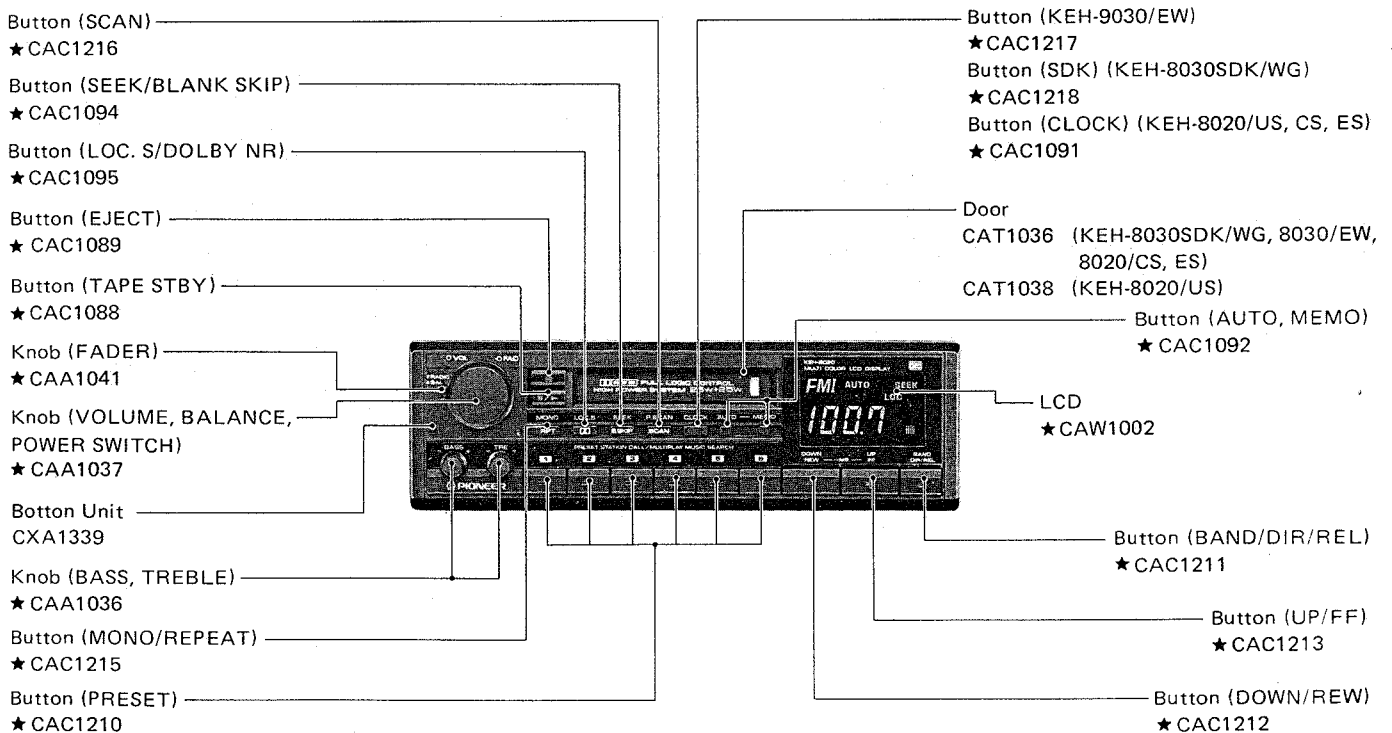
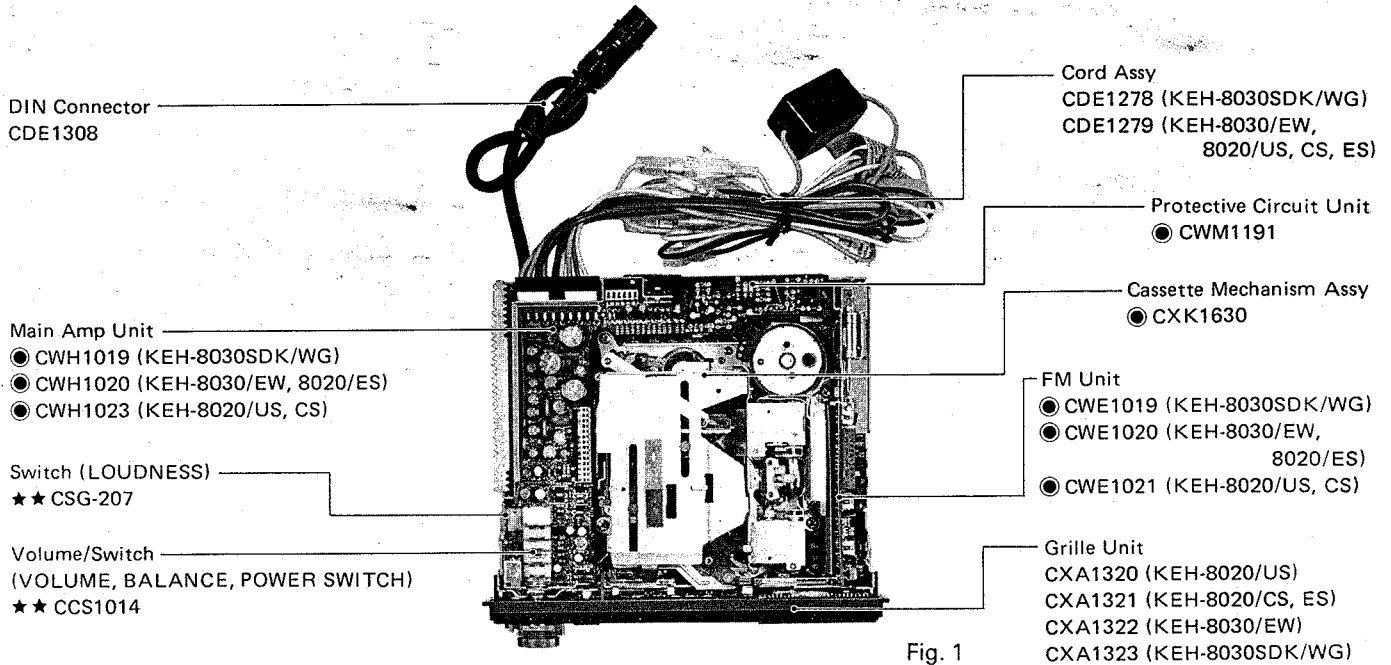
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2. PARTS LOCATIONS

The photo shows the model KEH-8020/ES.

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.



3. CONNECTION

Note:

- To avoid shorts in the electrical system, be sure to disconnect the battery cable before beginning installation.
- Replace fuses only with the types stipulated on the fuse holder.
- Be sure to properly connect the color coded leads. Failure to do so can cause malfunctions.
- Since a unique BPTL circuit is employed, never wire so the speaker leads are directly grounded or the left and right speaker leads are common.
- Speakers connected to this unit must be high-power type possessing maximum input of at least 25 W and impedance of 4 to 8 ohms. Connecting speakers with output and/or impedance values other than those noted here can damage the speakers.

Black (ground)	To vehicle (metal) body.
Yellow	To lighting switch terminal.
Blue	To auto-antenna power terminal (Max. 300 mA 12 V DC).
Red	To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Orange	To terminal always supplied with power regardless of ignition switch position.
Gray	To right speaker (+) terminal.
Gray/black	To right speaker (-) terminal.
Green	To left speaker (+) terminal.
Green/black	To left speaker (-) terminal.

- See the respective power amp owner's manual for detailed wiring (power supply, etc.) information.

Unit leads

Black (ground)	To vehicle (metal) body.
Yellow	To lighting switch terminal.
Blue	To auto-antenna power terminal (Max. 300 mA 12 V DC).
Red	To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Orange	To terminal always supplied with power regardless of ignition switch position.
Gray	To front/right speaker (+) terminal.
Gray/black	To front/right speaker (-) terminal.
Green	To front/left speaker (+) terminal.
Green/black	To front/left speaker (-) terminal.

Power amp leads

Gray	To rear/right speaker (+) terminal.
Gray/black	To rear/right speaker (-) terminal.
Green	To rear/left speaker (+) terminal.
Green/black	To rear/left speaker (-) terminal.

2-speaker system

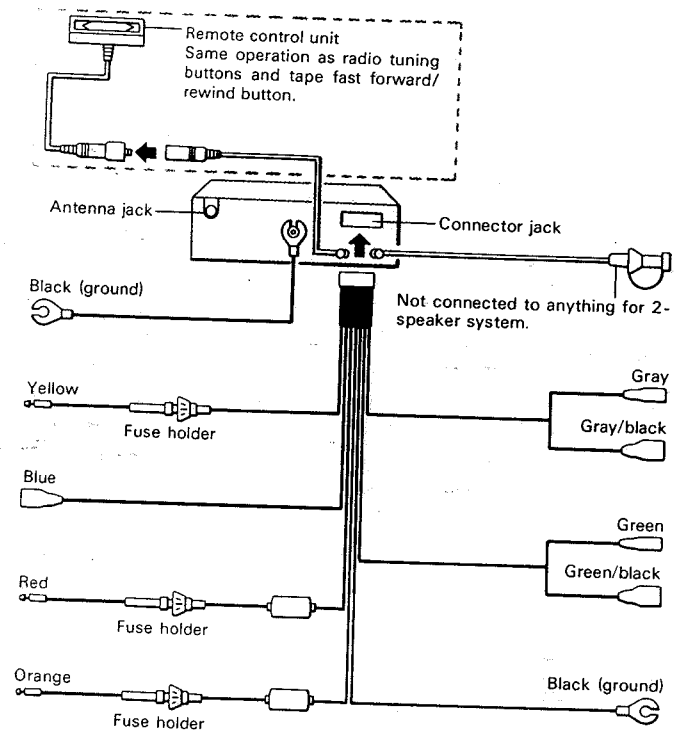


Fig. 3

4-speaker system

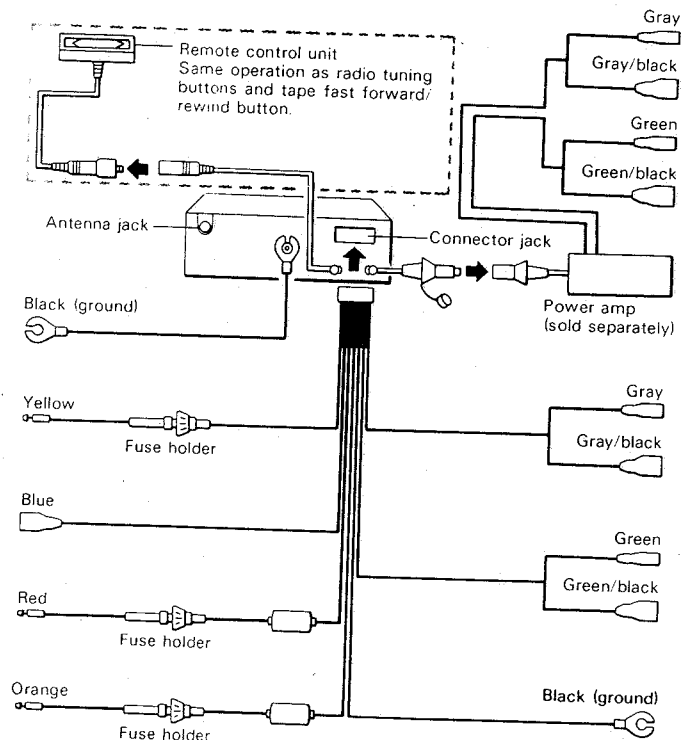


Fig. 4

4. OPERATION

• Using the Radio (KEH-8020/ES)

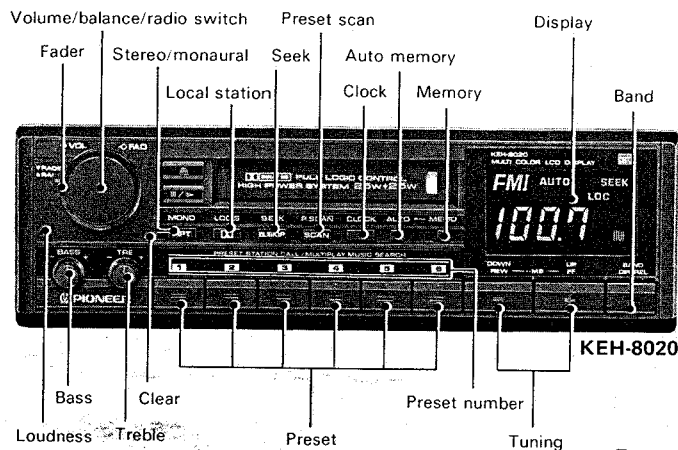


Fig. 5

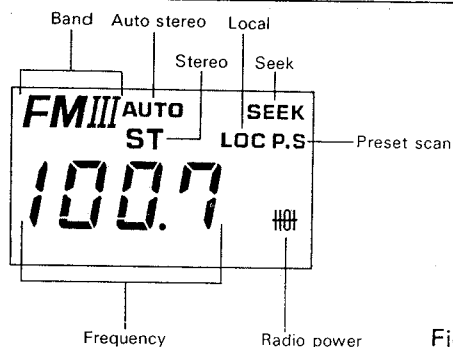


Fig. 6

• Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
 - Set the fader control to the left horizontal.
1. Press the radio switch to turn on power and display the frequency and the radio power indicator.
 2. Press the band switch to select the band.
 3. Press the seek button and the seek tuning indicator will be displayed.
 4. Press either the left or right side of the tuning button to tune in the desired frequency. (Pressing the right side will increase the frequency.)
 5. Adjust the volume and balance. To adjust the balance, first pull the knob until a click is heard. After setting to the desired level, push the knob in again to its original position.
 6. Adjust the tone.

• To enter a frequency into the preset memory...

7. Press the memory button and the preset number will flash. (approximately 5 seconds)
- Within 5 seconds, press one of the preset buttons (1–6) to enter the frequency into the memory. At this time the preset number of the button pressed will illuminate. Six FM1 frequencies, six FM2 frequencies, six FM3 frequencies and six AM frequencies can be entered.

• Auto Memory

The preset button numbers flash (for approximately 5 seconds) when the memory button is pressed. Pressing the auto memory button during this period causes the unit to search upwards from the currently tuned frequency. When receivable broadcasts are found, their broadcast frequencies are automatically assigned to the preset buttons from button 1 through 6. This function is automatically canceled once 6 frequencies are assigned or when the search operation returns to the original frequency from which the search was begun. Using this function while the local station function is ON results in recording of frequencies for relatively strong signals.

• Fader Control

This control is used to adjust the balance between the front and rear speakers when using a 4-speaker system. Turning the control upwards decreases the volume of the rear speakers, while turning it downwards decreases the volume of the front speakers. With 2-speaker systems, set this control to a horizontal position.

• Stereo/Monaural Switch

This switch is used to change from stereo to monaural for FM broadcasts, and is usually left in the stereo position (auto stereo indicator will illuminate on the display). When a stereo broadcast is received, the stereo indicator will illuminate. With the "Super Tuner III" function, stereo broadcasts can always be enjoyed in their optimal reception mode. If excessive noise is present, pressing this switch allows monaural reception of the broadcast.

• Local Station Switch

Pressing this switch lowers the seek tuning reception sensitivity so that only stronger signals can be tuned in. This feature is convenient when driving through areas that have numerous radio stations. When this switch is depressed, the local indicator will be illuminated on the display.

• Loudness Switch

When playing back a tape or listening to the radio at low volume, the low and high tones are emphasized and more clearly heard by pressing this switch.

• Clock Switch

Each press causes the display to switch between clock and frequency.

Seek Tuning

Press the seek button, and tuning to the next higher or lower broadcast on the band can be accomplished automatically by simply pressing either the left or right side of the tuning button. FM frequencies change in 0.2 MHz steps while those in the AM band change in 10 kHz steps.

Preset Scan Tuning

Pressing the preset scan button (preset scan indicator will illuminate on the display) causes previously stored frequencies to be tuned in sequentially for eight seconds each (preset number will illuminate). Press again when the desired frequency is tuned in to cancel preset scan tuning.

Preset Tuning

Pressing the preset button instantly tunes in the frequency programmed in the memory for that button.

Manual Tuning

When manual tuning is employed, FM frequencies change in 0.2 MHz steps while AM frequencies change in 10 kHz steps.

1. Press the seek button and the seek tuning indicator will disappear from the display.
2. Change the frequency by pressing either the left or right side of the tuning button. Pressing the button once will change the frequency one step (see above). Continuously depressing either side of the button will successively change the frequency at the prescribed step.

• Clear Button

This button is generally used only to correct conditions such as abnormal operation of the built-in microprocessor, power supply failure, failure of the control buttons or an abnormal display. Should such conditions occur, press the clear button with a thin pointed object. This operation deletes the frequencies stored in memory and the time setting for the clock.

• Using the Tape Deck

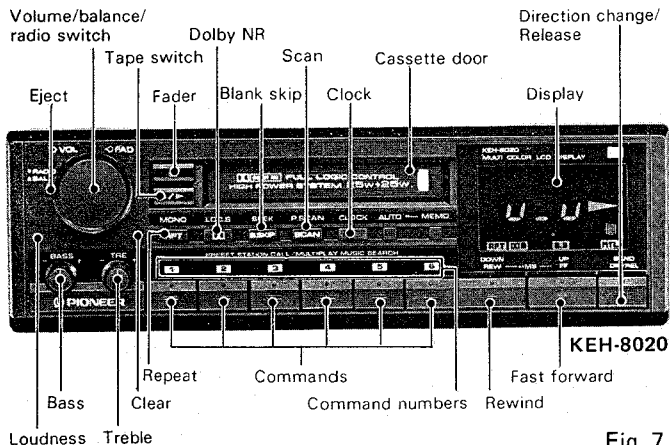


Fig. 7

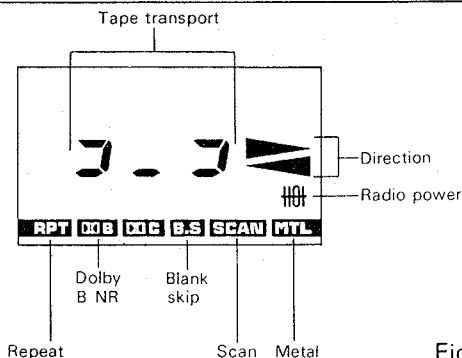


Fig. 8

• Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
 - Set the fader control to the left horizontal.
1. Insert a cassette partway into the tape slot until the mechanism takes over to automatically set the cassette and begin playback. The unit automatically switches over to tape play even if the power of the radio is ON.
 2. Adjust the volume and balance.
To adjust the balance, first pull the knob until a click is heard. After setting to the desired level, push the knob in again to its original position.
 3. Adjust the tone.
 4. When tape playback reaches the end of the tape, playback will automatically switch from the side being played to the opposite side (ie. Side A to Side B or vice versa) (Auto-reverse). Press the tape switch to stop playback. Pressing this switch again resumes playback from the point at which it was originally stopped.
 5. Press the eject button to eject the cassette from the unit.
- Do not try to eject the cassette immediately after insertion, as it will cause malfunction. Wait a few seconds.
 - The cassette automatically ejects from the unit if tape setting operations cannot be completed within a few seconds. This may be caused by a faulty or damaged cassette. Try to determine the cause of the problem or use a different cassette.

•Fast Forward/Rewind

Pressing the fast forward button transports the tape forward at high speed. The auto reverse function causes playback to switch automatically from SIDE A to SIDE B (or vice versa) when the end of the tape is reached. Pressing the rewind button rewinds the tape at high speed. The auto replay function causes playback to begin again from the same side of the tape when the beginning of the tape is reached. Both fast forward and rewind are canceled by pressing the release button.

•Direction Change Button

This button is used to switch from one side of the tape to the other (from Side A to Side B or vice versa).

•Auto Tape Selector

The equalizer automatically switches between 70 μ s and 120 μ s in accordance with the type of tape being used. 70 μ s tapes have a hole on the half of the cassette which is detected by the unit. Using a metal or chrome tape causes the metal indicator to appear on the display. Nothing is displayed when normal tapes are used.

•Dolby B-C NR Switch (KEH-9020)

Press to select the proper setting when playing a tape recorded with Dolby NR. Each press of this switch changes the setting in the following sequence: Dolby B NR $\rightarrow$ Dolby C NR $\rightarrow$ Dolby NR OFF. The current setting is indicated on the display.

Skip Search

This function allows high speed search for the beginning of a specific selection on a tape. The search range is 5 selections in the rewind direction and 6 selections in the forward direction for a total range of 12 selections (including the current selection).

• Moving back from selection F to selection D

1. Press command button [3] and the number above the button will light for approximately 7 seconds.
2. Pressing the rewind button (—) during this period rewinds the tape to the beginning of selection D (command number [3] flashes), and normal playback resumes.
- Pressing the fast forward button (+) in place of the rewind button advances the tape the number of selections specified by the command button.
- The release button can be used at any time to cancel the skip search function and return to normal playback from that point.

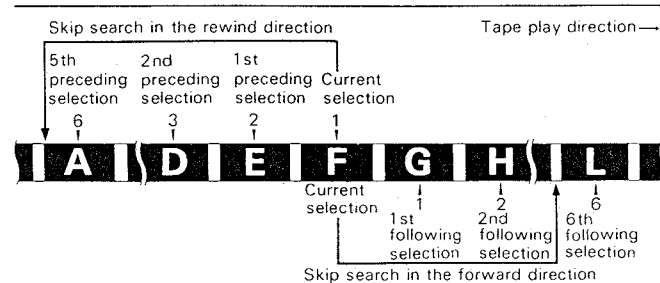


Fig. 9

•Dolby NR Switch

Press when playing a tape recorded with Dolby NR.

•Blank Skip Button

Causes playback to move at high speed over lengthy unrecorded portions of the tape (longer than 10 seconds) to the point at which the recorded portion resumes. The blank skip indicator appears on the display when this button is pressed.

•Clear Button

This button is generally used only to correct conditions such as abnormal operation of the built-in microprocessor, power supply failure, failure of the control buttons or an abnormal display. Should such conditions occur, press the clear button with a thin pointed object. Performing this operation during tape playback causes playback to stop.

Music Scan

This function is very useful when searching for a specific selection on a tape. The beginning (approximately 9 seconds) of each selection is played back and then unit advances to the next selection at high speed.

1. Press the music scan button (scan indicator appears on display).
2. Pressing the release button cancels music scan and causes normal playback to resume from that point.

Music Search

The music search function can be used to return to the beginning of the current selection or to move ahead to the beginning of the next selection.

• Returning to the beginning of selection F

Simply pressing the rewind button (—) twice causes the number above command button [1] to flash. In a short while, playback automatically resumes from the beginning of the current selection.

- Pressing the fast forward (+) button twice causes playback to move to the beginning of the next selection and resumption of normal playback.
- Pressing the fast forward/rewind button 3 times consecutively returns to normal playback

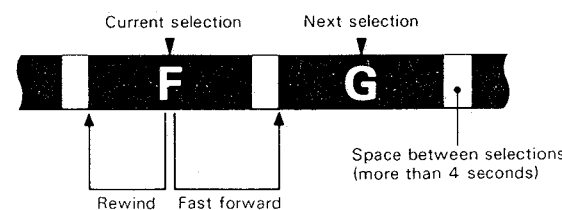


Fig. 10

Music Repeat

The music repeat function causes continuous repeat play of a selection until the function is canceled.

• For example

To repeat selection F, pressing the music repeat button while selection F is playing causes the music repeat indicator to appear on the display. Selection F will repeat from beginning to end until the music repeat function is canceled.

- The release button or music repeat button can be used at any time to cancel the music repeat function and return to normal playback from that point.

• Setting the Time (KEH-8020/US, ES, CS)

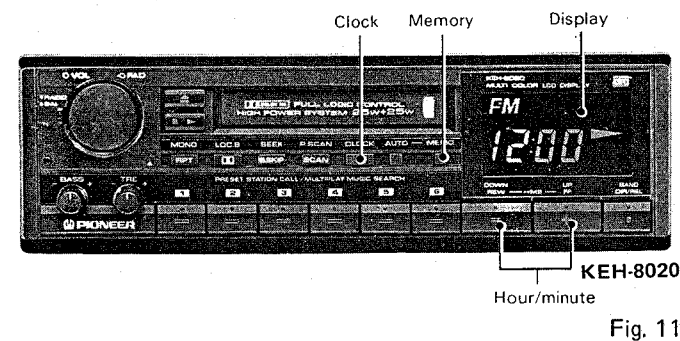


Fig. 11

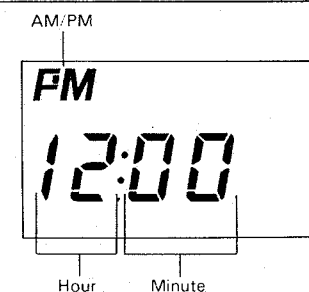


Fig. 12

1. Press the clock switch to switch to the time display.
2. Each press of the left side of the hour/minute control button while holding down the memory button advances hour display by one hour. Each press of the right side advances minute display one minute. Holding down either side of the hour/minute control button advances the respective hour/minute display at high speed.

- When the hour display reaches "12", AM/PM indicator switches.

• Repeating selection F three times

1. Press the music repeat function while selection F (for example) is playing and the music repeat indicator will appear on the display.
2. Press command button [3] (the number above the button lights) and selection F will automatically be repeated three times.

The following situations can result in improper operation of the music scan, skip search, music search and music repeat functions even though the unit is operating properly.

- Unrecorded "blank" portions between selections is less than 4 seconds — the blank portion cannot be detected by the unit.
- Pauses in recorded conversations are longer than 4 seconds — the unit reads these as blanks between selections.
- Portions are recorded at very low volume for more than 4 seconds — the unit reads these as blanks between selections.

• Pre out level Switching (KEH-8020/US, CS)

Be sure that the power of the unit is OFF before changing the position of the PRE OUT switch. Failure to do so can cause damage to the speaker because of excessive output.

Set the pre output level to match the power amp input level for 4-speaker system configurations. Set to 70 mV when a PIONEER power amp is used.

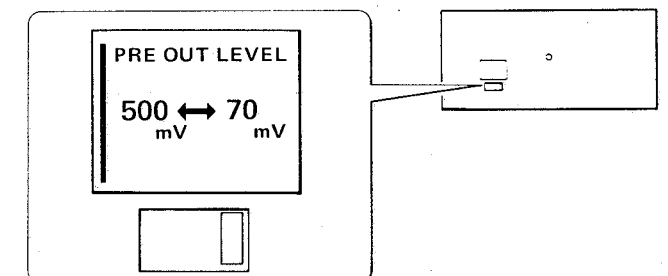


Fig. 13

5. BLOCK DIAGRAM

• Signal and control line (KEH-8030/EW)

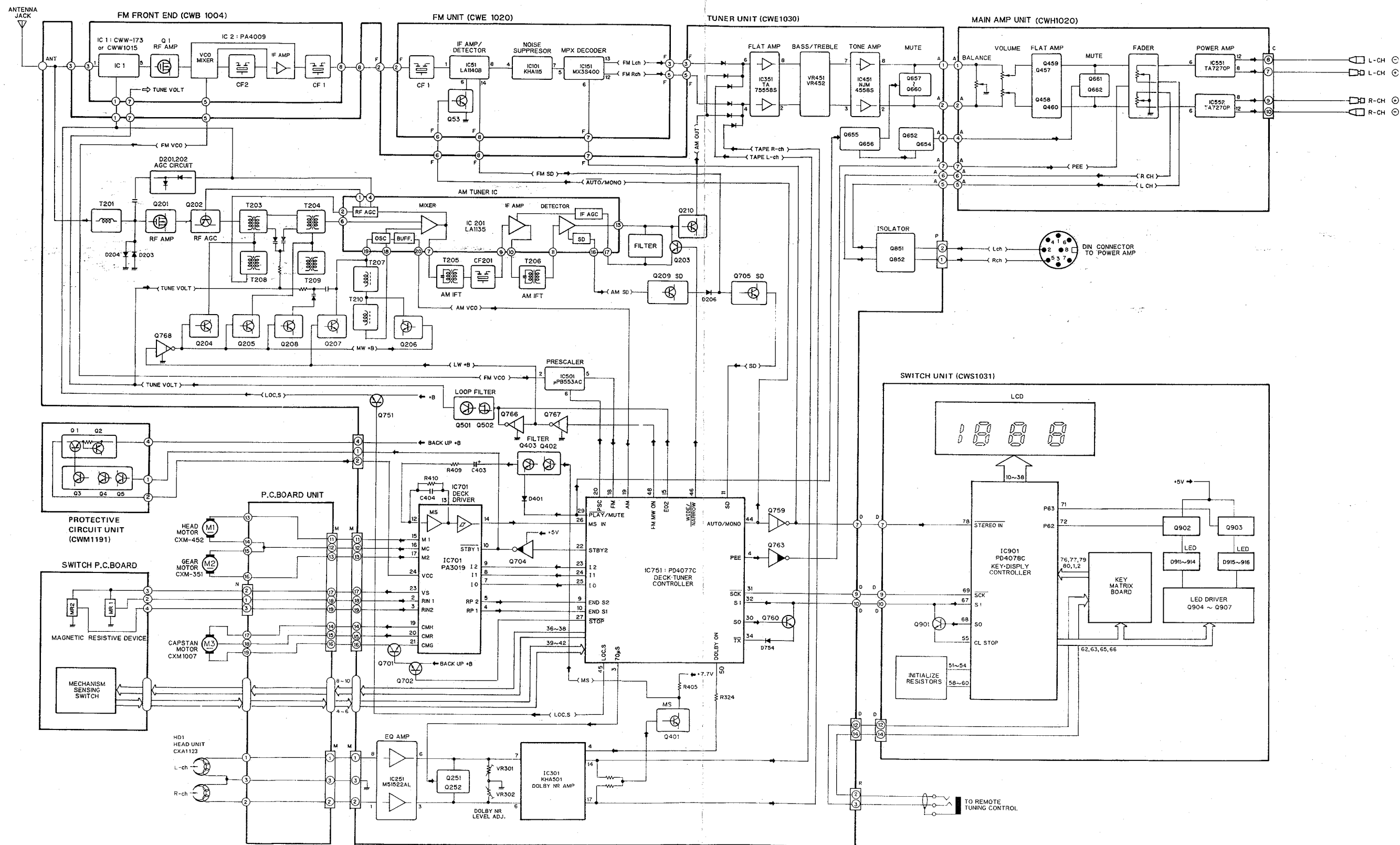


Fig. 14

• +B Line (KEH-8030/EW)

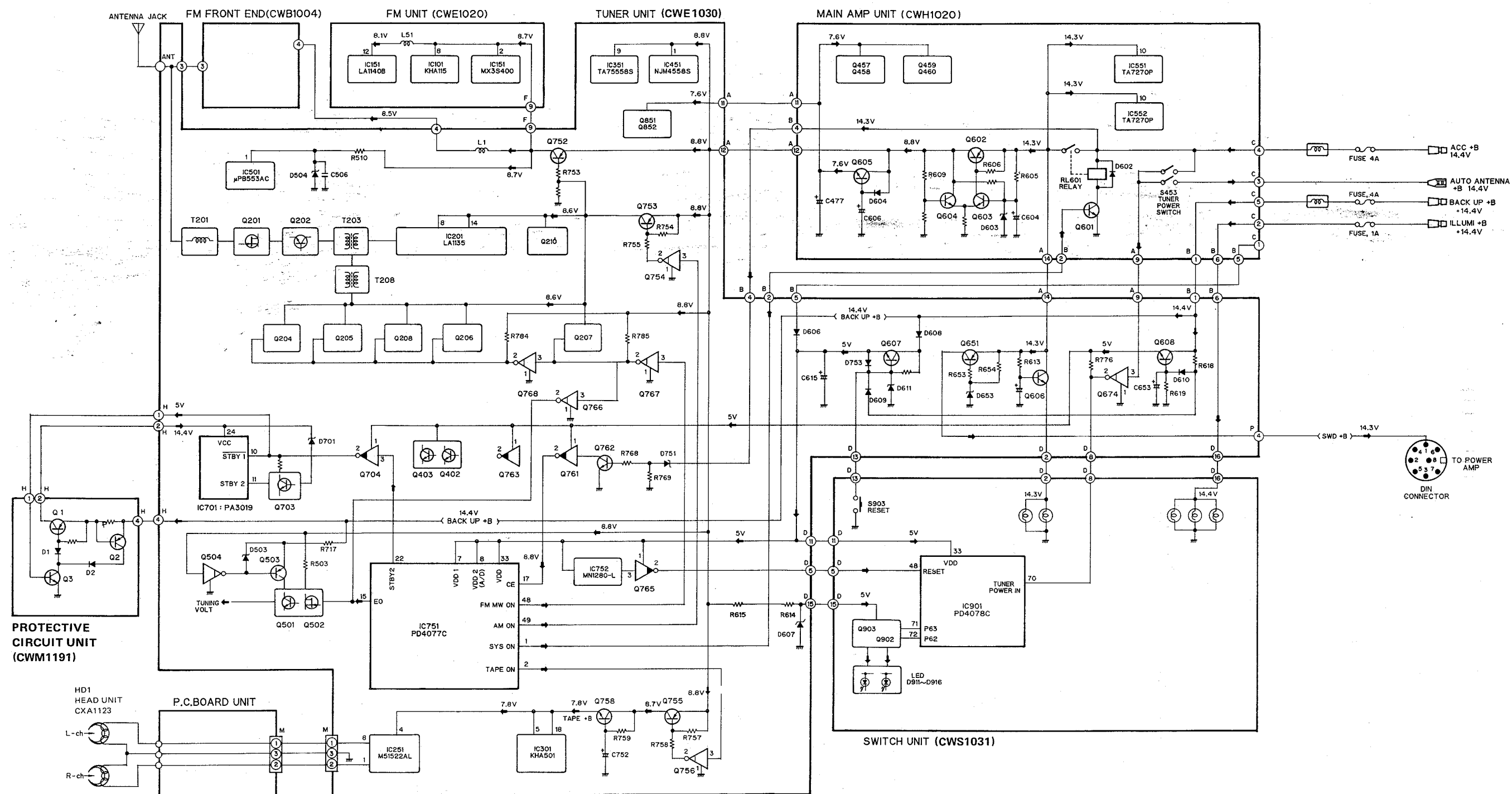


Fig. 15

6. LEVEL DIAGRAM

• KEH-8030 SDK/WG

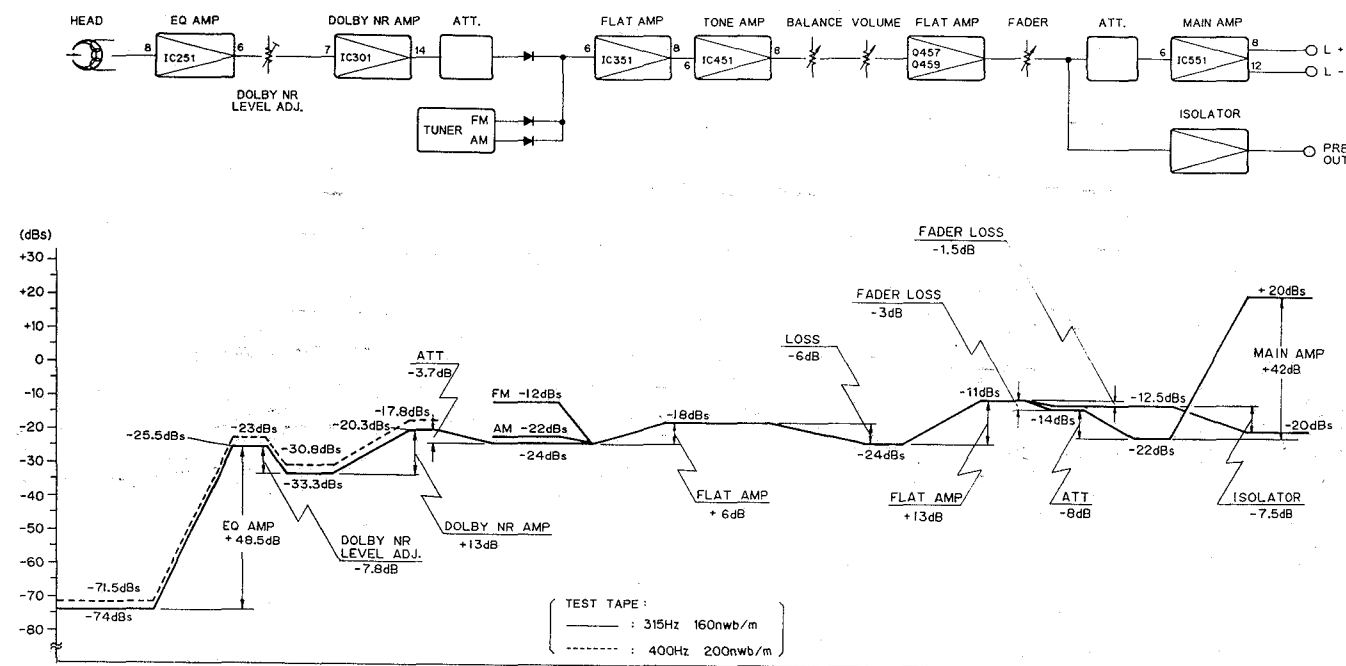


Fig. 16

• KEH-8030/EW, 8020/ES

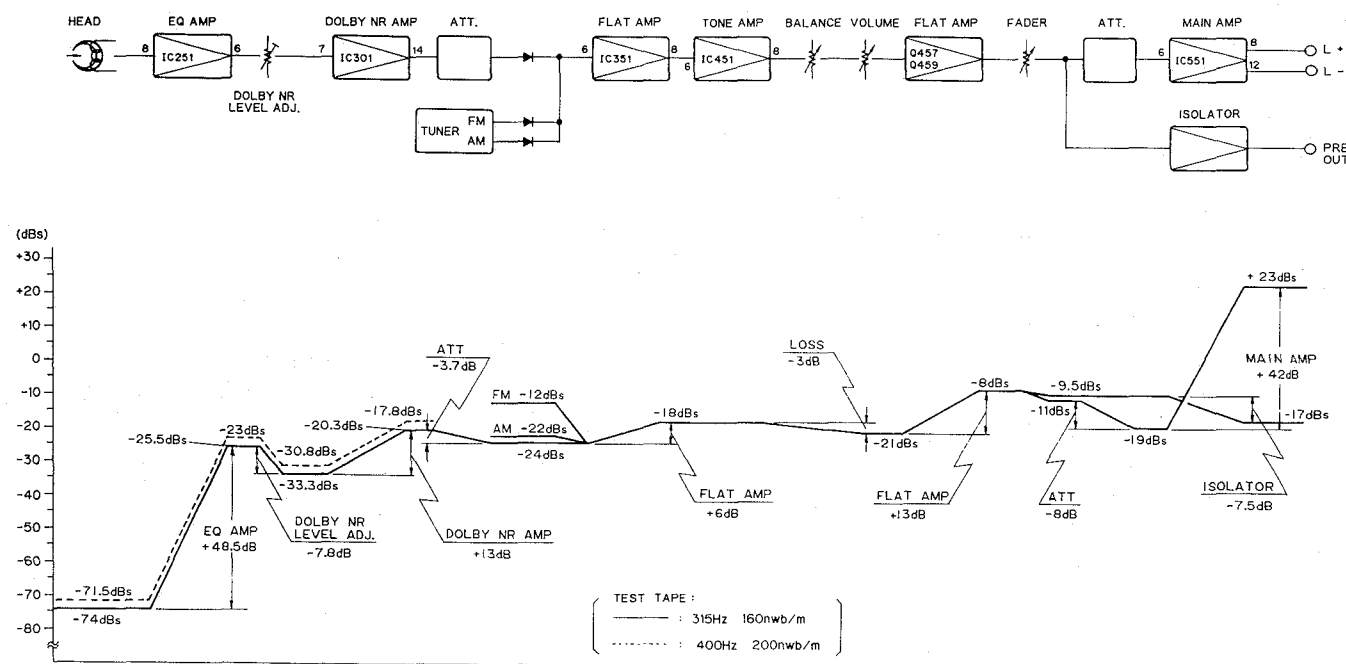


Fig. 17

• KEH-8020/US, CS

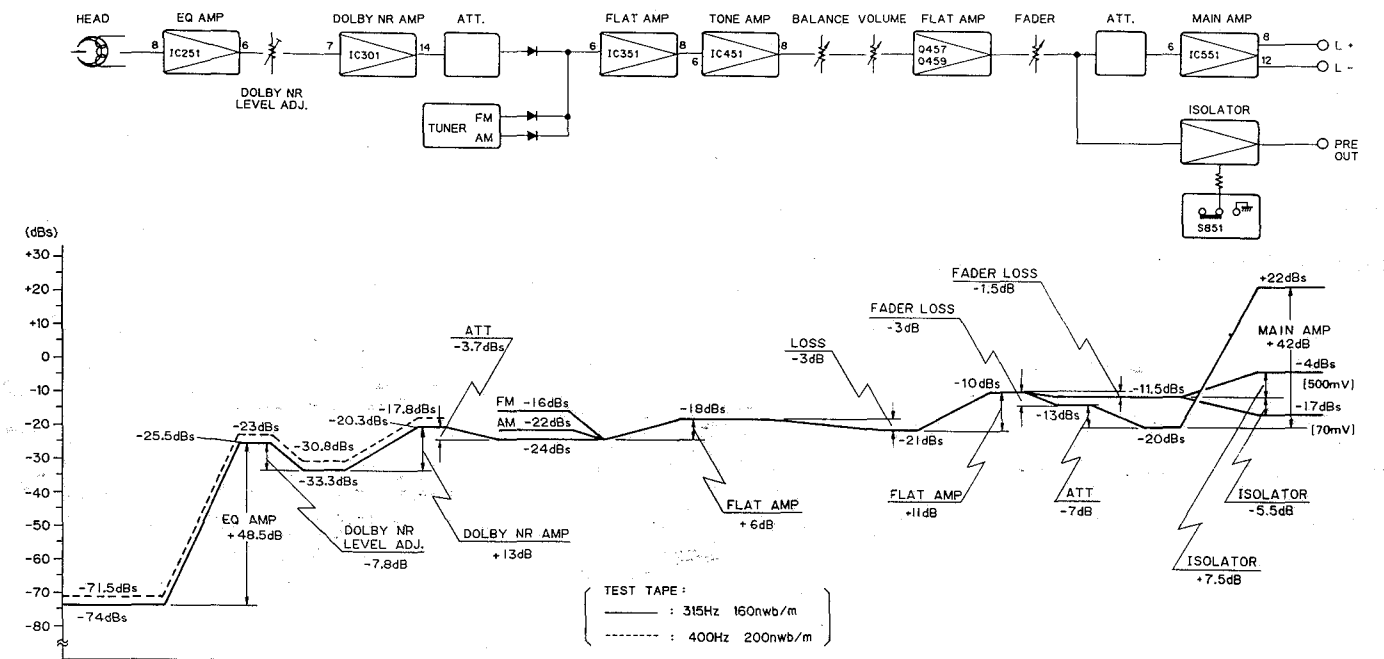


Fig. 18

7. CIRCUIT DESCRIPTION

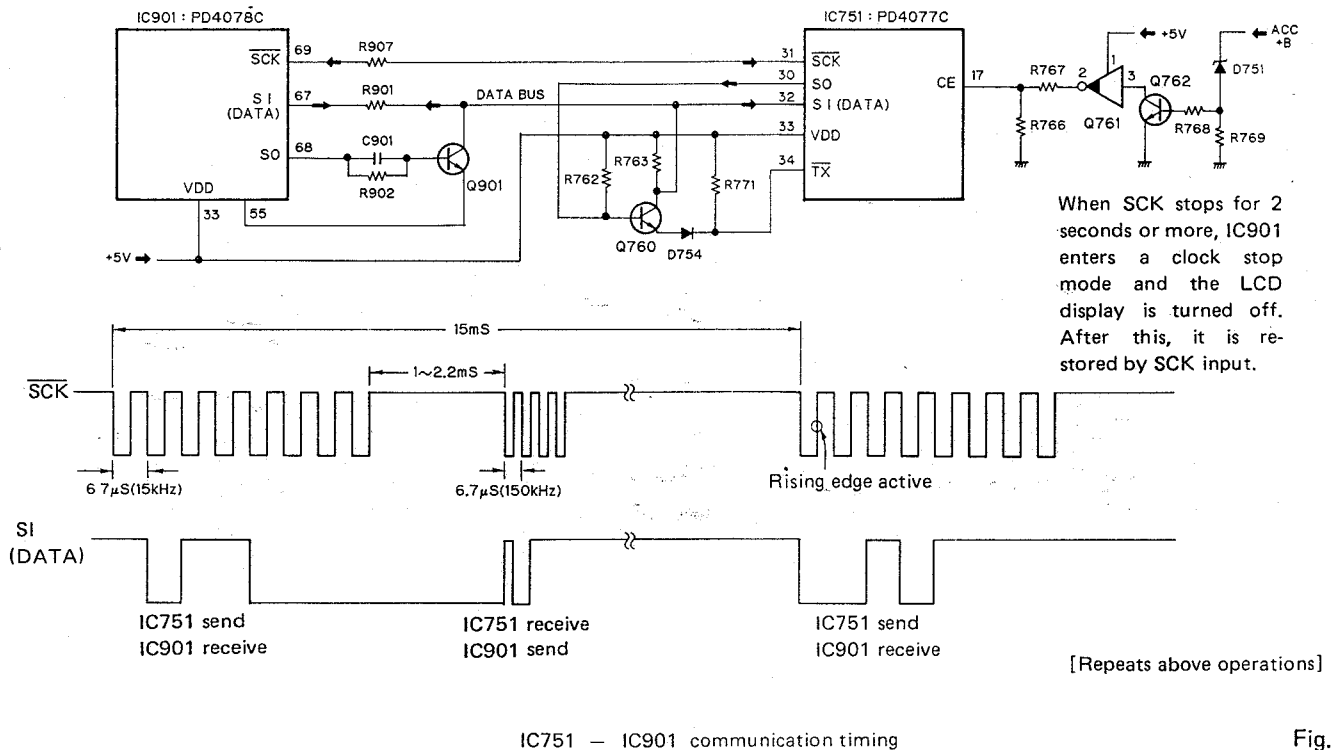


Fig. 19

● System Outline

This unit has a 2-chip configuration which connects the deck and tuner controller IC (IC751, PD4077C) to the key display controller IC (IC901, PD4078C) by 8-bit serial data communication. System control for the deck, tuner and muting is performed by IC751.

Key input and LCD display control is performed by IC901. Also, SDK model DK counting (125Hz detection) is performed by IC901.

● Serial Data Communication

When ACC+B is entered, IC751 pin (17) becomes HIGH and 8-bit serial data (condition code) is sent by IC751 pin (30) to start communication.

After this, 8-bit serial data (command code) is sent by IC901 pin (68) to terminate one-time communication.

A set of communication condition and command codes is sent once every 15ms as a response. However, in the first communication after IC751 read reset, condition code is sent with 5ms spacing. After this, the communication spacing becomes 15ms after command code is properly sent back from IC901.

Therefore, if the communication spacing remains constant at 15ms (sometimes 10ms, 20ms during operation), it can be determined that normal communication is performed.

An abnormal communication line is detected by both IC751 and IC901. After an abnormality detection, restart condition code and a restart command are sent in the next communication. Then the system is reset by software to accomplish status and function initialization excluding the clock and preset channel memory.

● Clock Stop

In regard to KEH-8030 SDK/WG, EW, since IC901 pin (51) is set to LOW, quick release occurs after read reset. Two seconds after ACC+B becomes OFF and IC751 pin (17) becomes LOW, the IC751 system clock stops which stops communication. The IC901 system clock stops 2 seconds after IC751 condition code sending stops in the same way. However, the IC901 system clock stops 2 seconds after communication stops without any relationship to IC901 pin (51) LOW or HITH selection. For example, when the SCK line is cut, the system clock stops 2 seconds after that.

The Q901 emitter is connected to a HIGH terminal during clock stop while the Q760 emitter is connected to a LOW terminal (IC751 pin (34)) through a diode during communication so that current is not consumed by the communication circuit during clock stop.

IC751 pin (34) becomes LOW during communication and is also provided with a function to prohibit communication during LOW.

● Mute Circuit

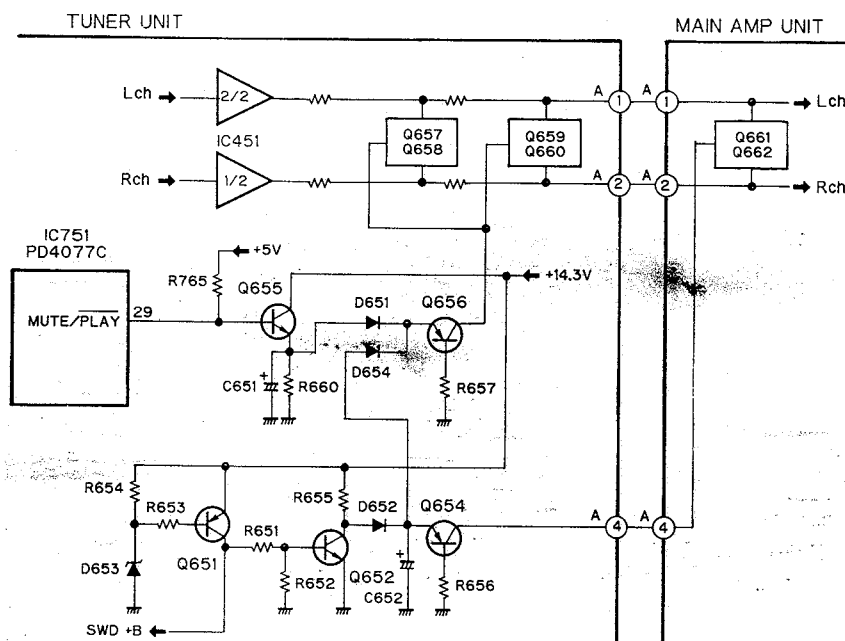


Fig. 20

● Mute Circuit

1) Microcomputer mute

A Mute signal is provided by MUTE output from IC751 pin (29).

When IC751 pin (29) becomes HIGH, Q655 becomes ON, then Q656 becomes ON and a HIGH is applied to Q657-660 base to apply muting. The return time is delayed by C651.

During Tuner mode

- (1) During tuner ON/OFF.
- (2) During frequency modulation and operation except that for the preset channel key.
- (3) When SDK is ON and no SK station reception occurs (SK mute).

* (4) During DK interruption.

During Tape mode

- (1) All timing excluding cassette mechanism play operation.
- (2) During overrun compensation in MS operation.

* (3) During DK interruption.

NOTE

* During DK interrupt, mute is applied to the main audio signal line to open another DK dedicated audio signal line.

2) Mute during power supply off

When 14.3V drops to 8.2V, Q651 base current does not flow due to D653 which becomes OFF. When Q652 is turned OFF, Q654 and Q656 are turned ON and HIGH is applied to the Q657-662 base to perform muting. The return time is delayed by C652.

● Reel Unit Rotation Pulse Detection Circuit

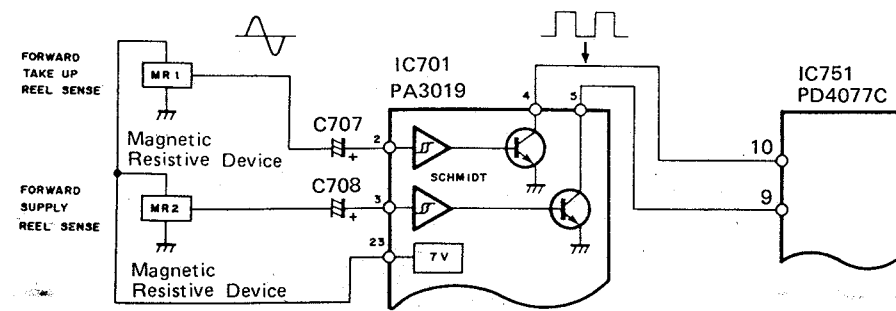


Fig. 21

- A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC701, and a square wave is output from pins 4 and 5 (IC701) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When no pulse is detected for more than 1.2 seconds, the circuit senses that the tape has ended and changes the tape direction.
2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 600 ms), the deck switches to the play mode.

3. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

● MS Circuit

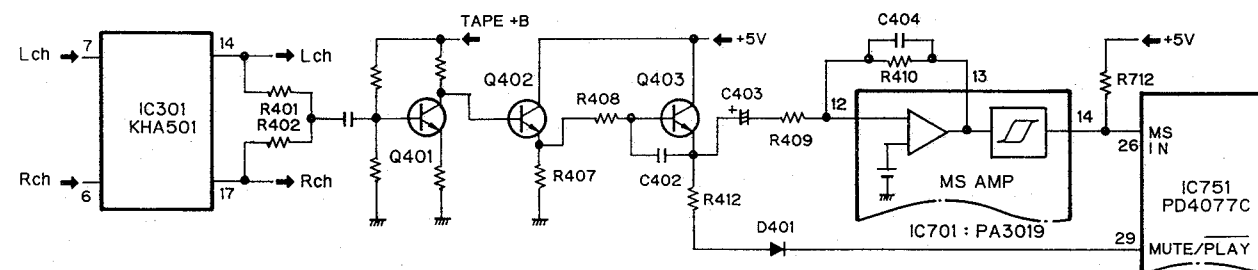


Fig. 22

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC701), and a Schmitt comparator (inside IC701). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC701 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC751, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. **"Play" Music Selection (Equivalent circuit diagram 23):** IC751 pin 29 goes "low", and Q403 go to the "on" position. Since Q403 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R408. The gain from either the left channel or the right channel to IC701 pin 13 is approximately 45 dB. The low range cut off frequency is approximately 300 Hz and the high range cut off frequency is approximately 7 kHz.

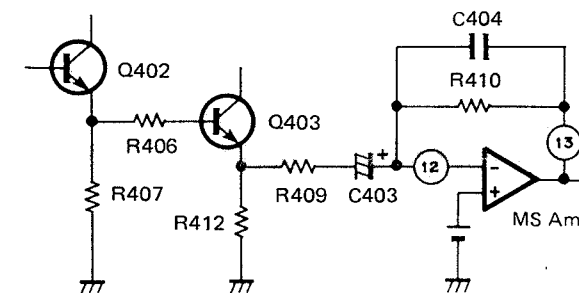


Fig. 23 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

2. **"FF" "REW" Music Selection (Equivalent circuit diagram 24):**

IC751 pin 29 goes "high", and Q403 go to "off". At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off frequency is approximately 7 kHz.

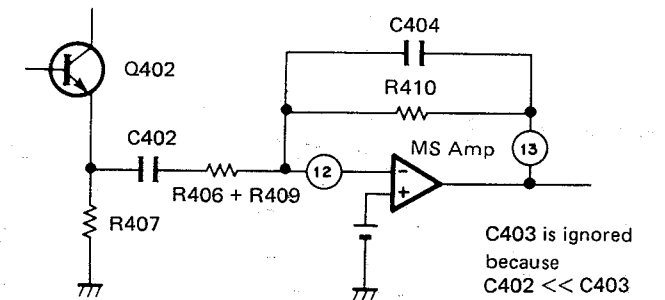


Fig. 24 Equivalent Circuit During the MS Mode

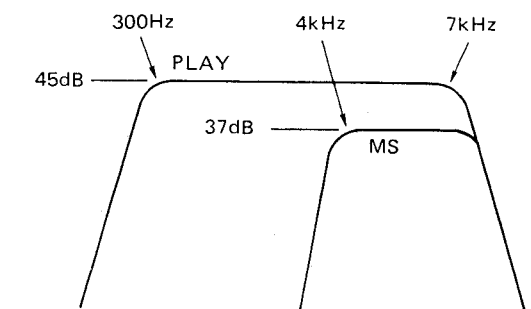


Fig. 25 Filter Characteristics

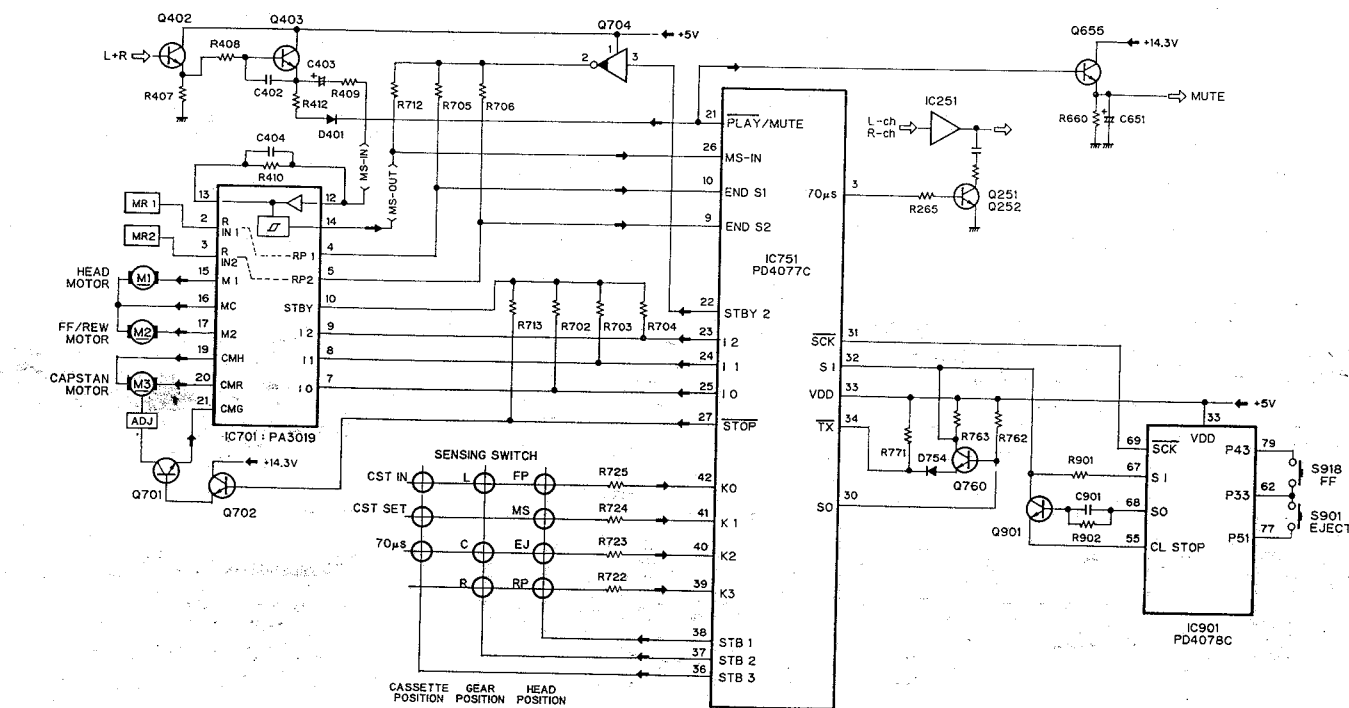


Fig. 26

Location of Cassette Mechanism Assy

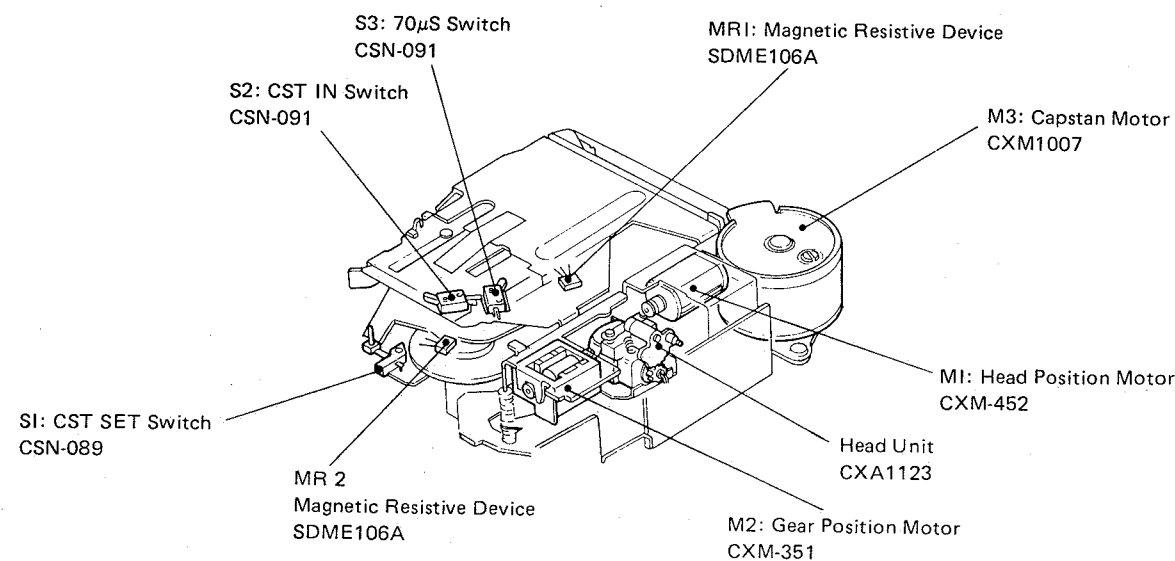
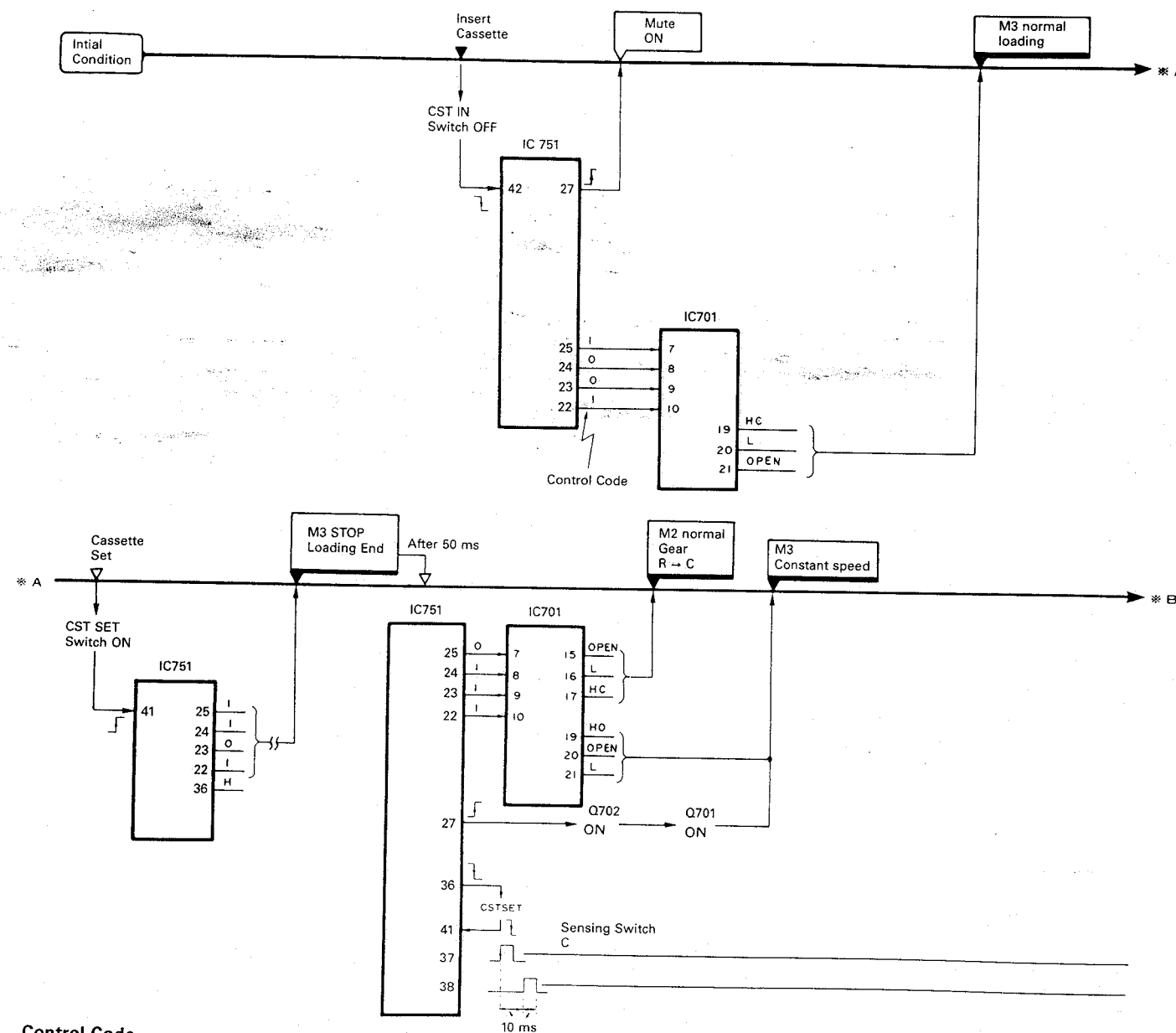


Fig. 27

Operation

1. Insert Cassette Tape

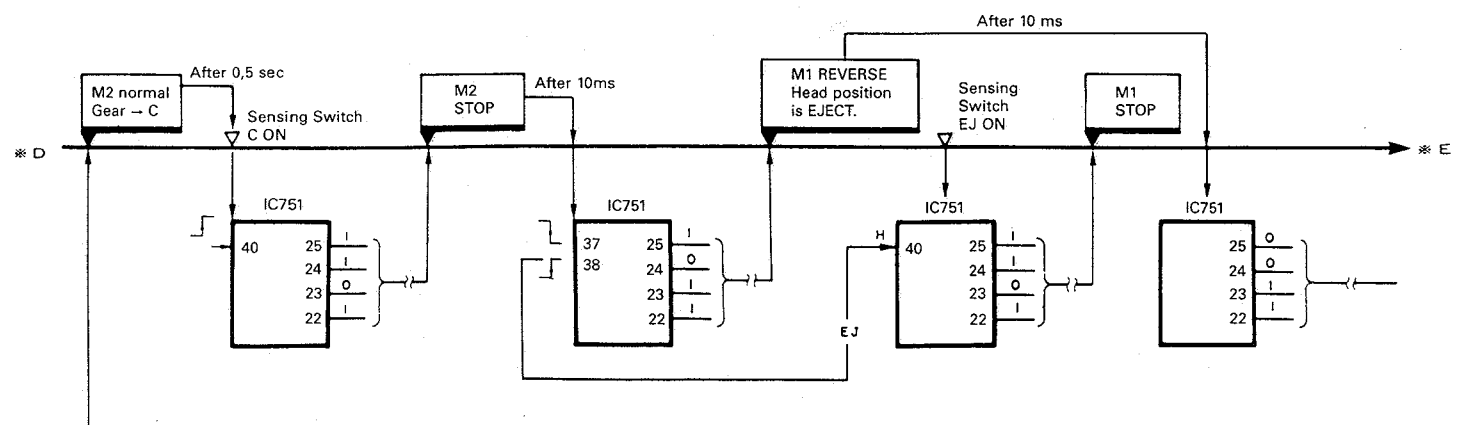
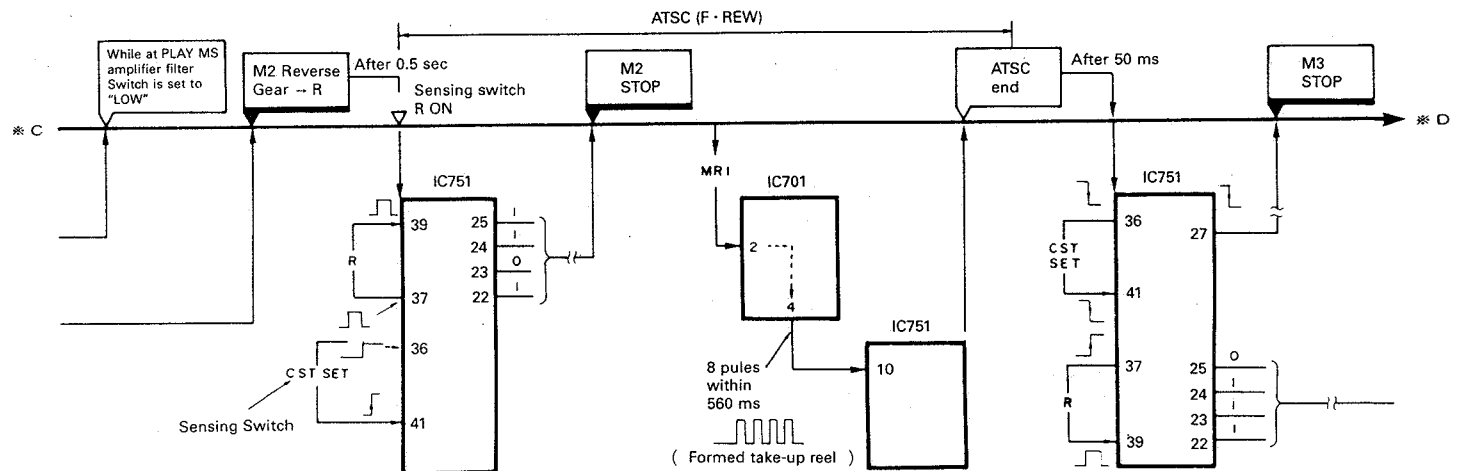
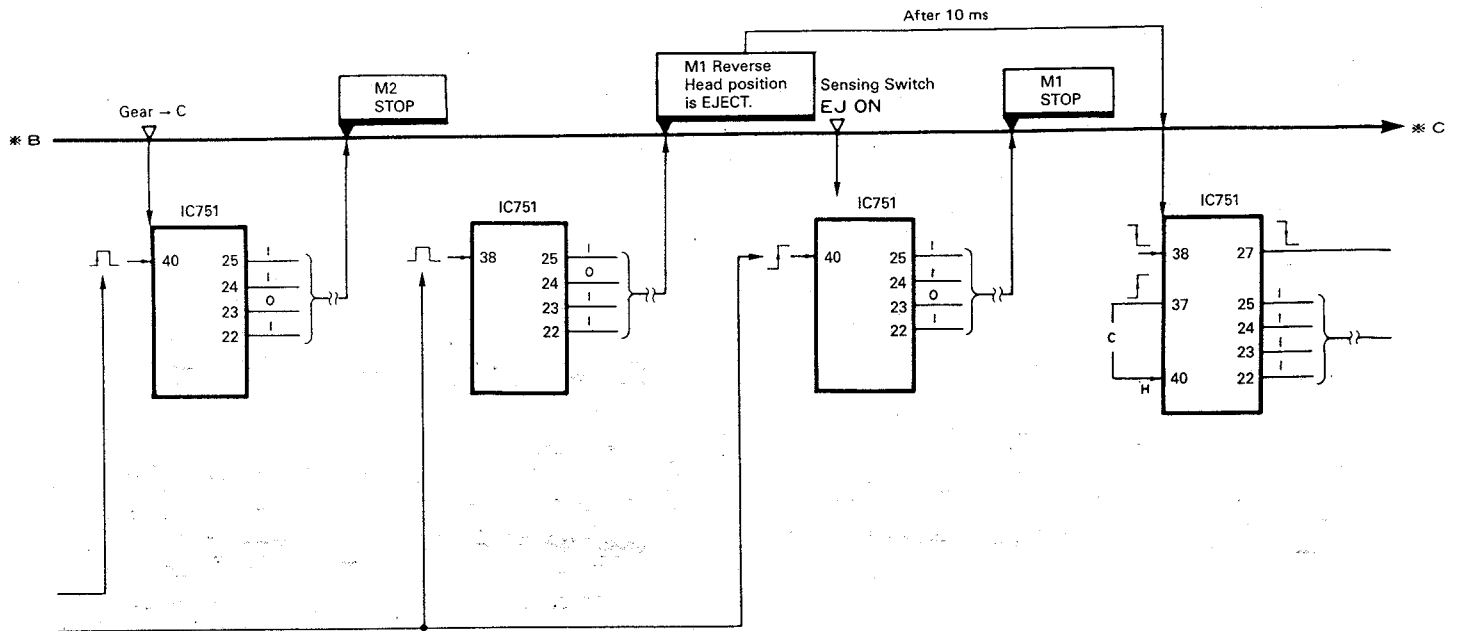


Control Code

Control Mode	IC751: PD4077C				Mechanism Operation	IC701: PA3019					
	25	24	23	22		Output Terminal Voltage					
Output OFF	0	0	0	0	Release	19	20	21	15	16	17
M3 (CM)	Normal	1	0	0	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	0	Eject	L	HC	↑	↑	↑	↑
	Constant speed	1	1	0	PLAY, FF, REW or MS	HO	OPEN	L	↑	↑	↑
M1	Normal	0	0	1	HEAD EJ → FP	↑	↑	↑	HC	L	↑
	Reverse	1	0	1	HEAD EJ → RP	↑	↑	↑	L	HC	↑
M2	Normal	0	1	1	Gear direction: R → L	↑	↑	↑	OPEN	L	HC
	Reverse	1	1	1	Gear direction: L → R	↑	↑	↑	↑	HC	L

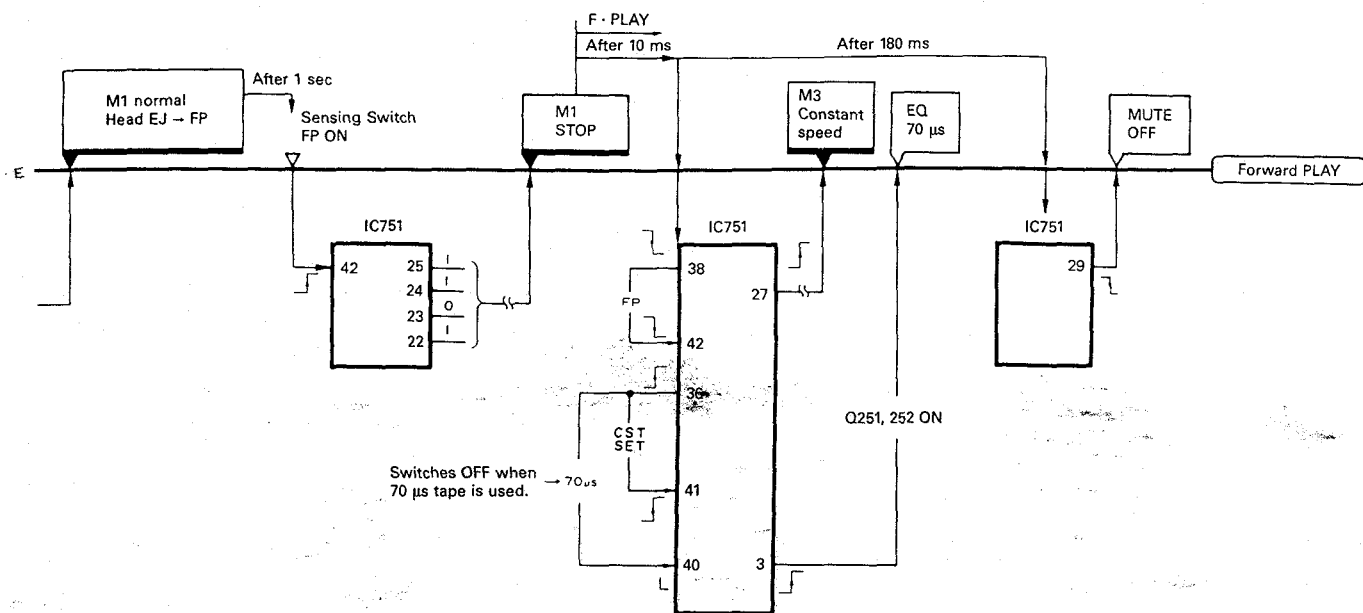
*Output terminal voltage

HC Approx. 7V HO Vcc — 1.7V OPEN High impedance L 0V

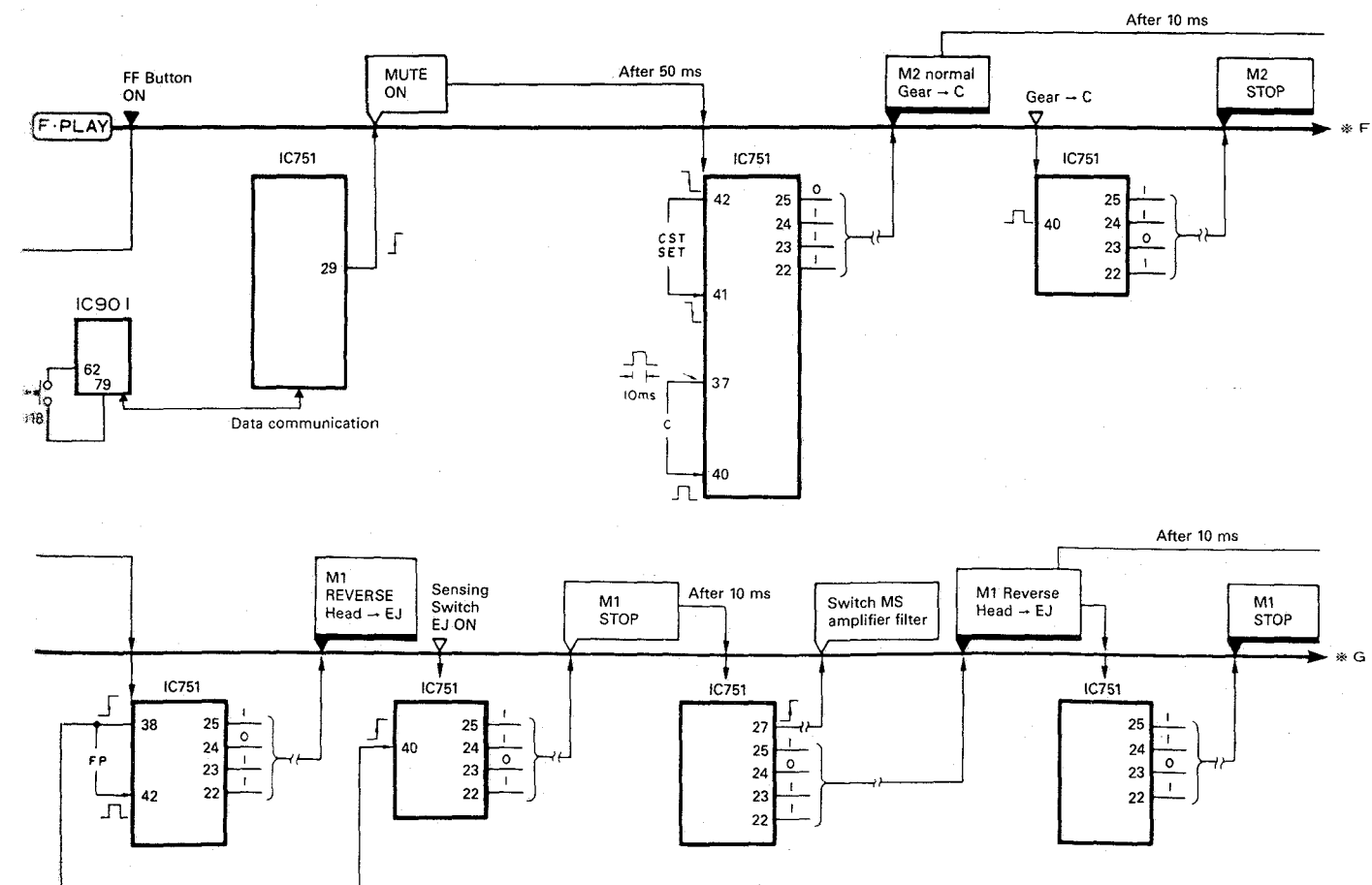


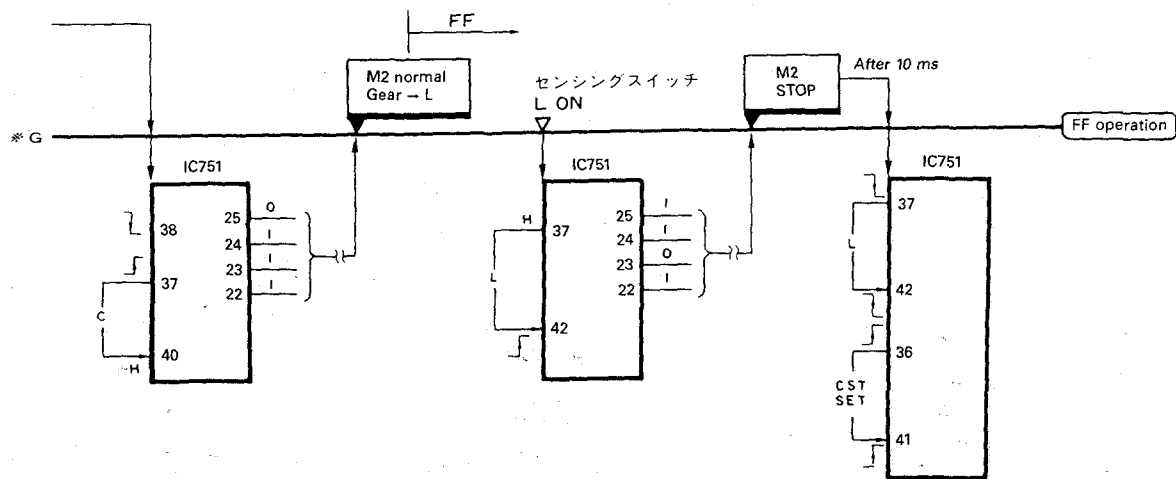
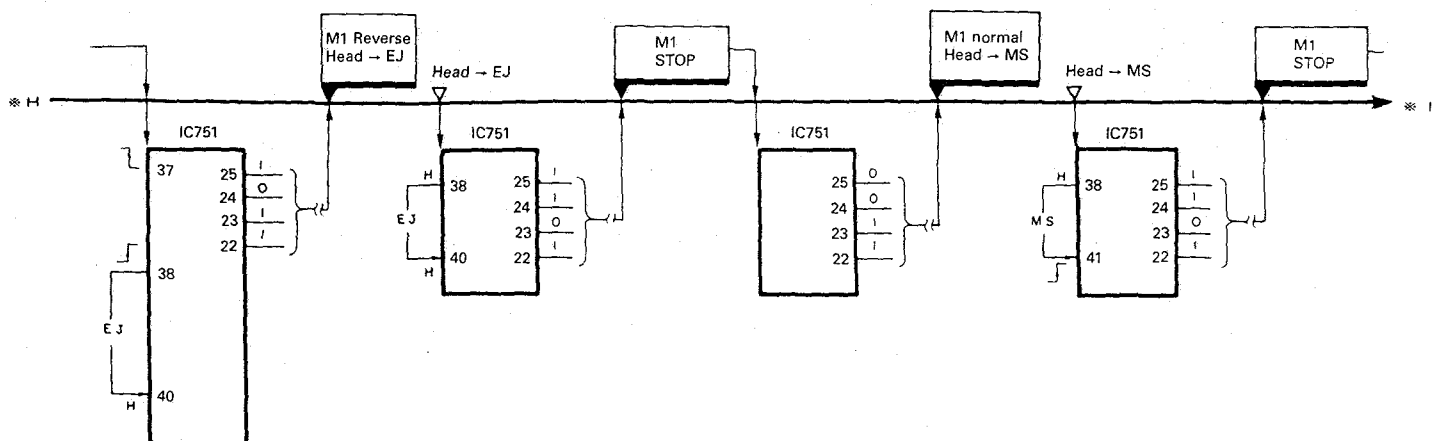
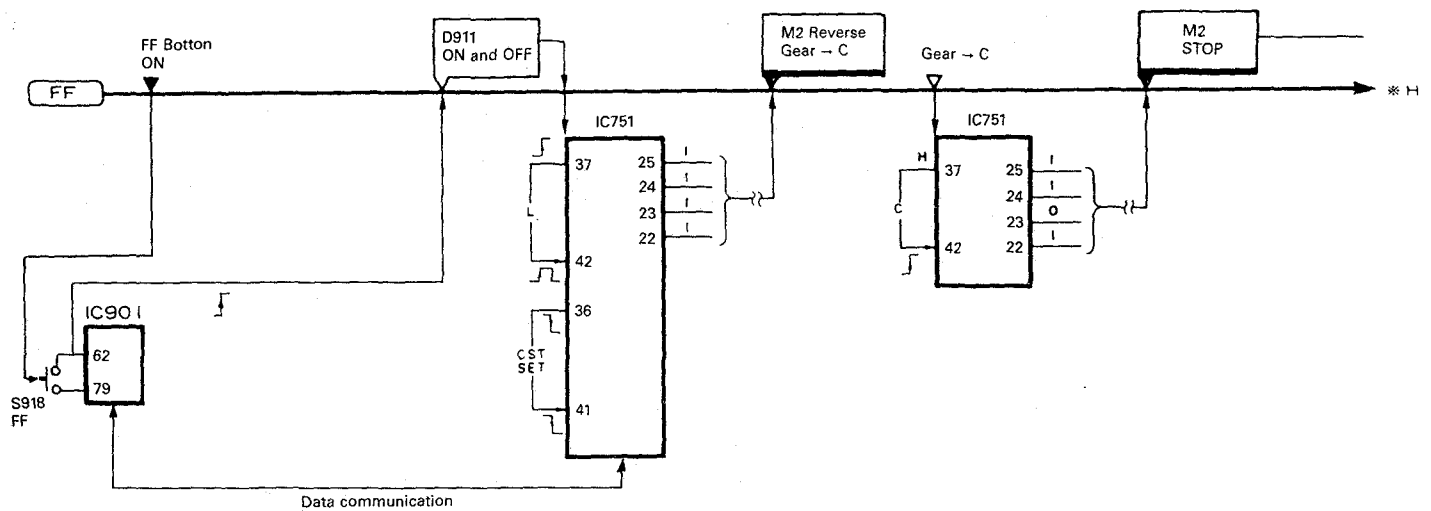
Sensing Switches

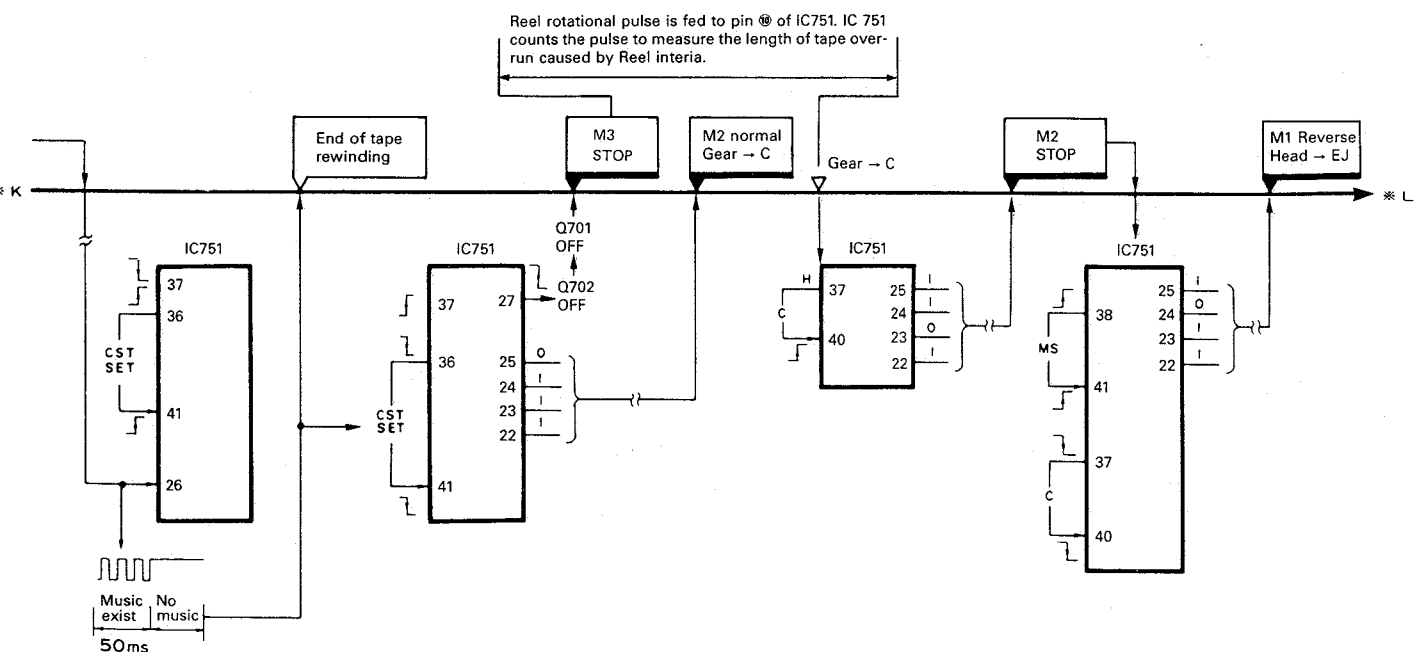
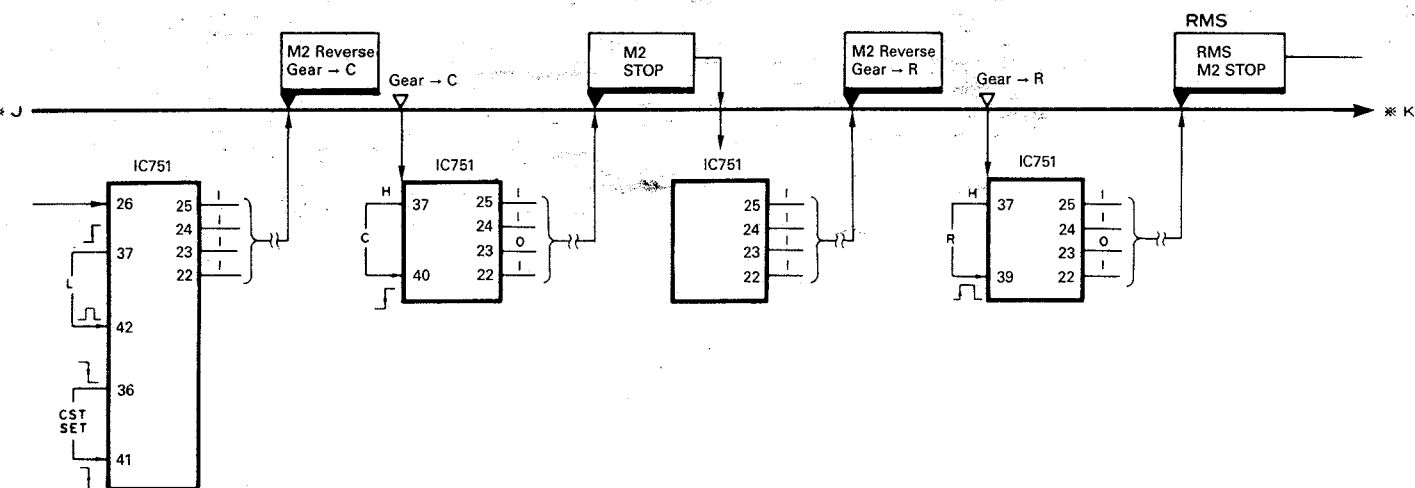
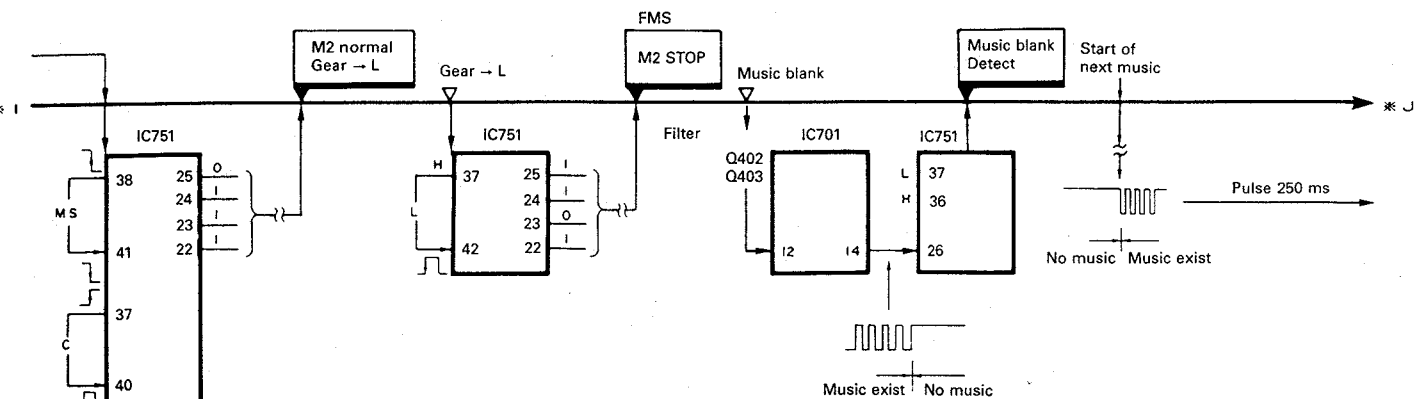
	Switch	Function		Function	Switch
Cassette Position	CST IN	Turned OFF when a cassette tape is inserted.	Head Position	FWD PLAY	FP
	CST SET	Turned ON when the cassette tape is set in position.		MS	MS
	70 μ s	Turned OFF when a 70 μ s cassette tape is inserted.		Eject	EJ
FF/REW Gear Position	L	FF in FWD (normal) and REW in REV.		REV PLAY	RP
	C	Eject or Play			
	R	REW in FWD (normal) and FF in REV.			

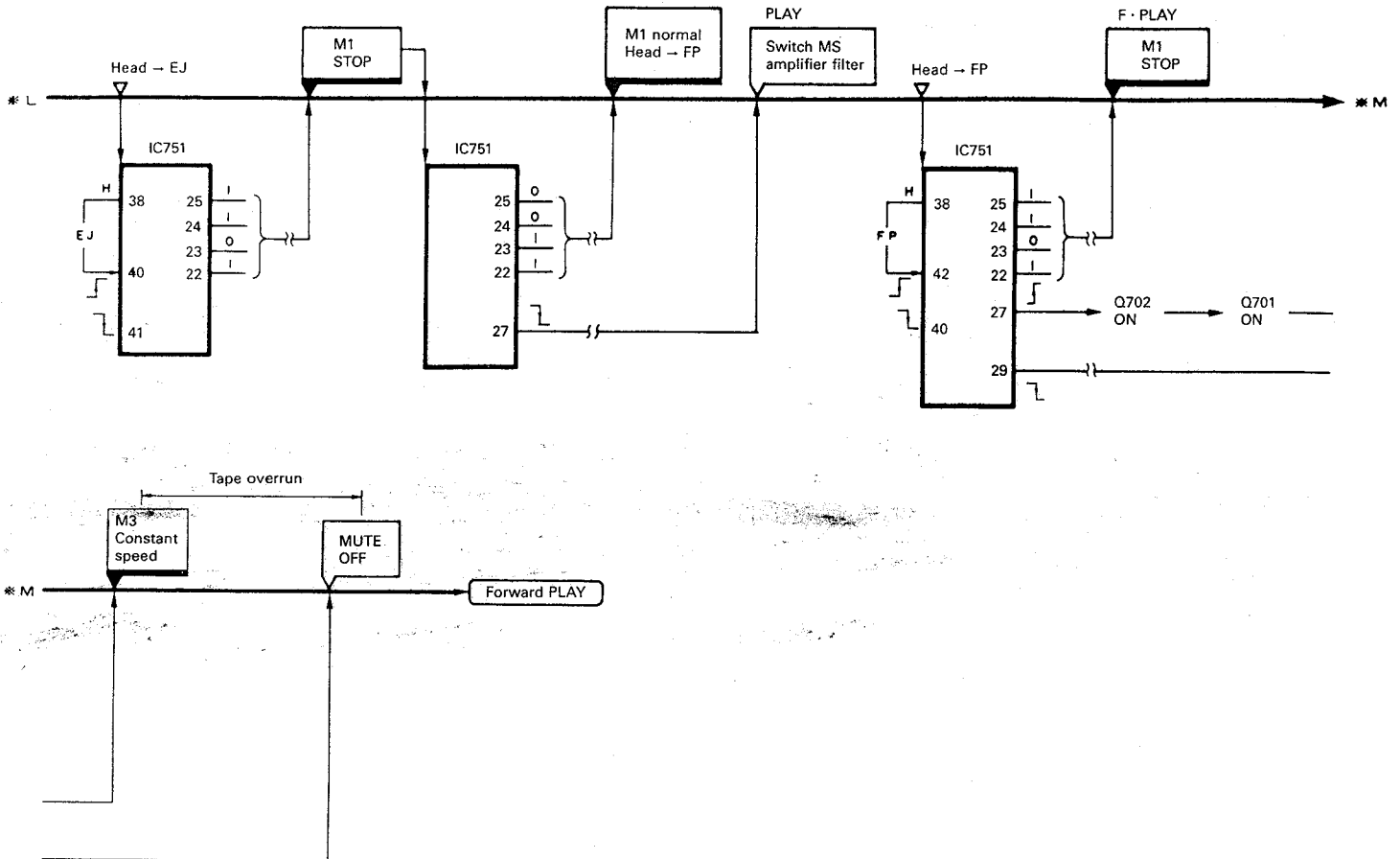


2. F · PLAY → FF

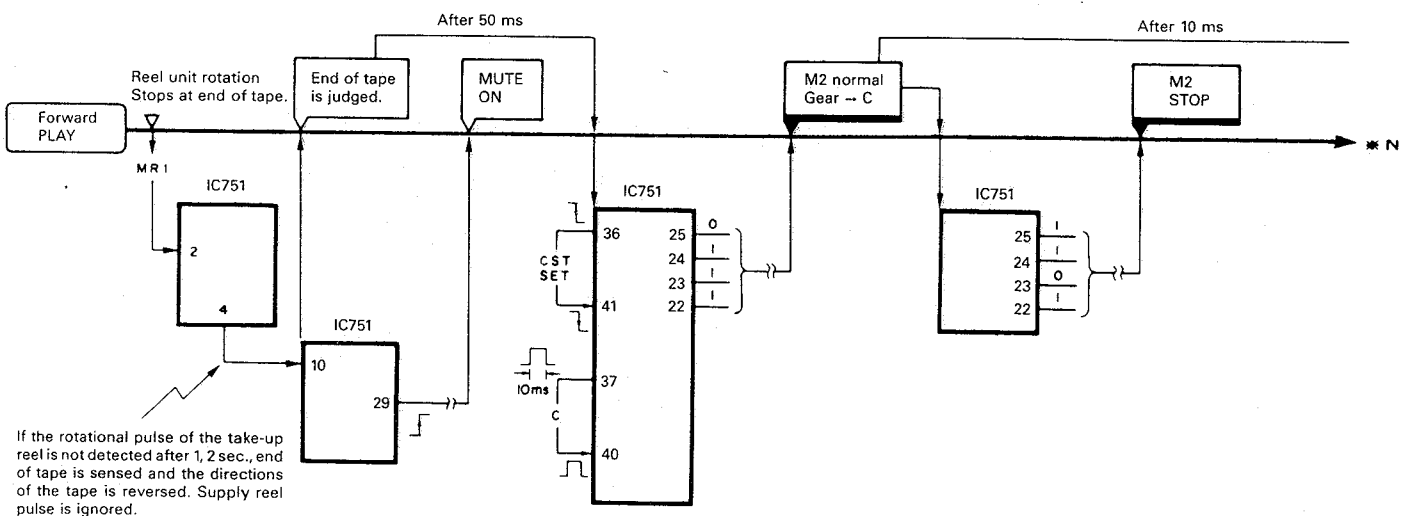


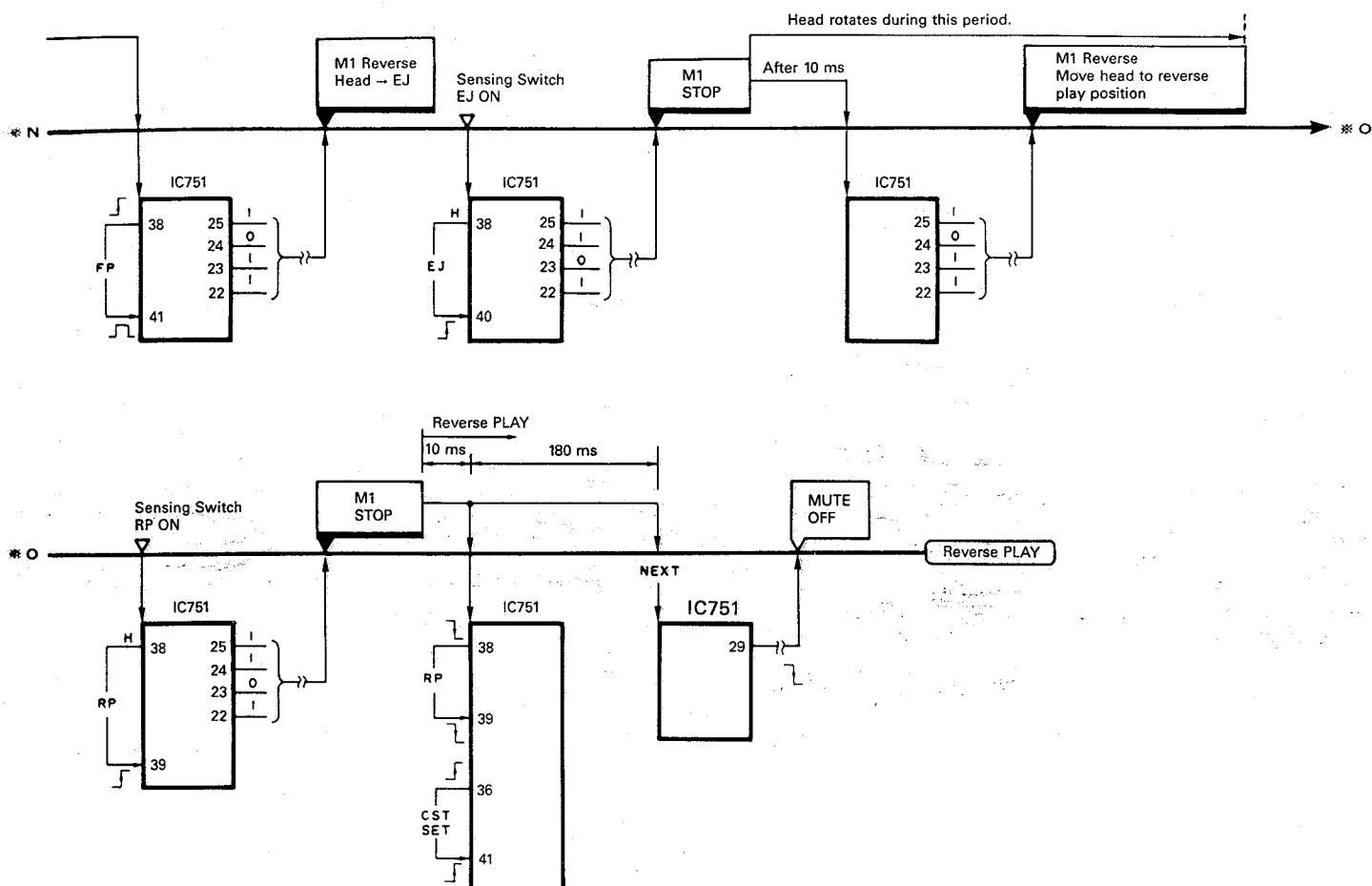
3. FF $\rightarrow$ F $\cdot$ MS



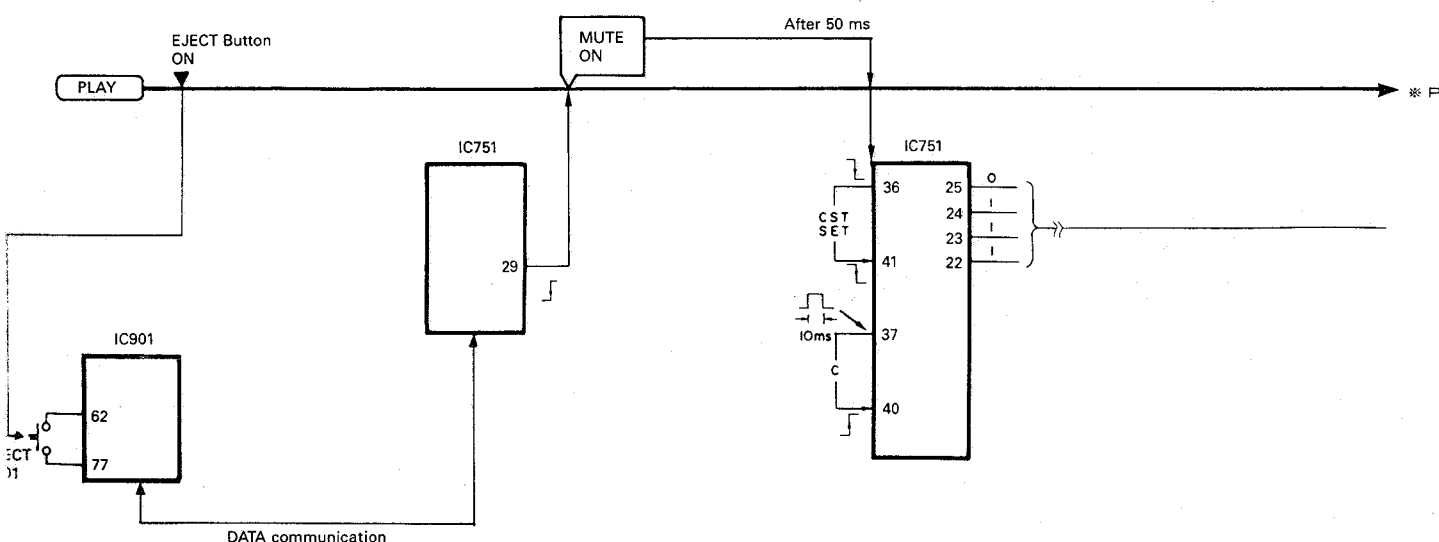


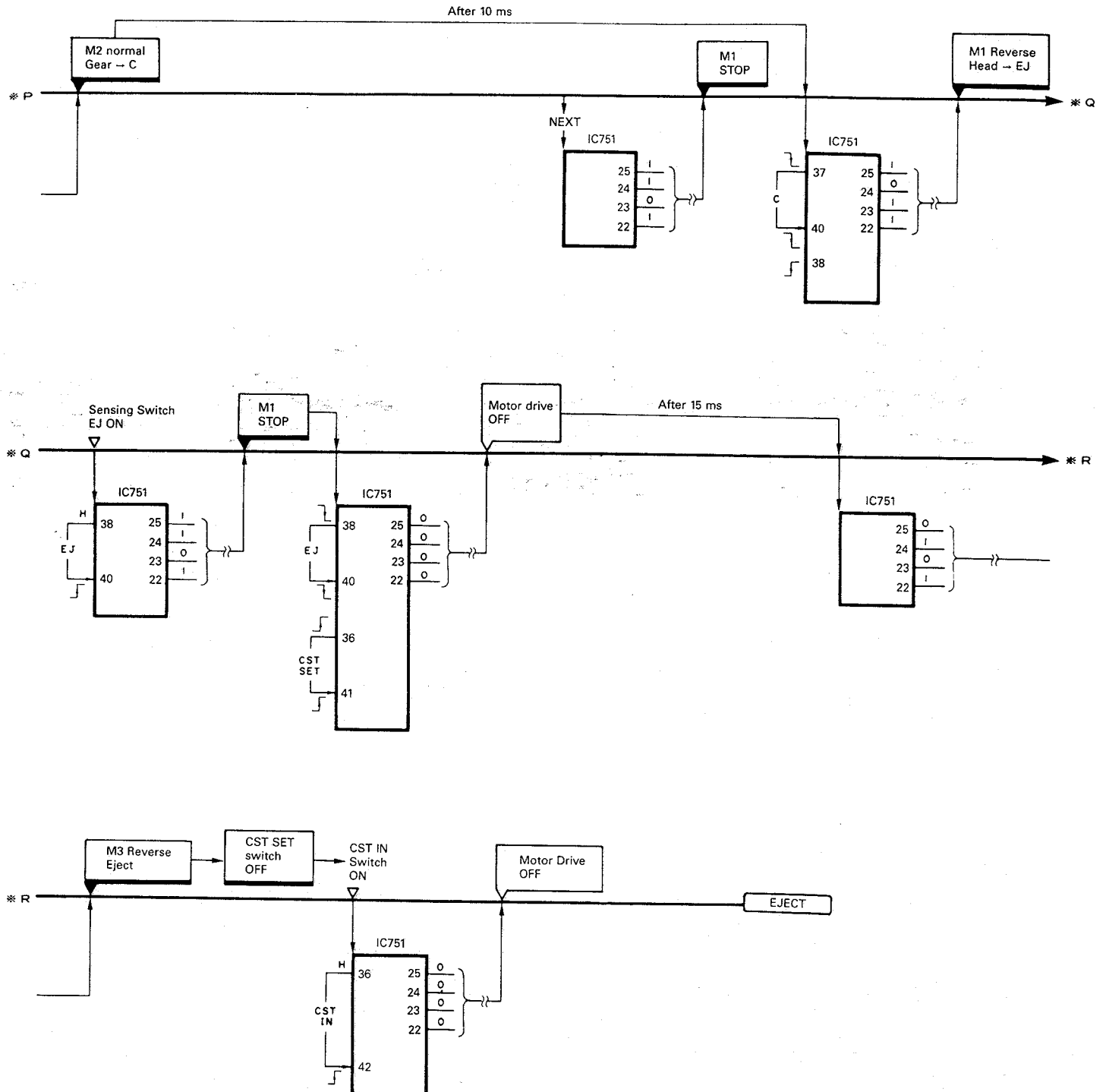
4. Forward PLAY → Reverse PLAY





5. PLAY → EJECT





8. DISASSEMBLY

● Removing the Case Unit

1. Remove the Connector.
2. Remove the four screws (A), and remove the Case Unit.

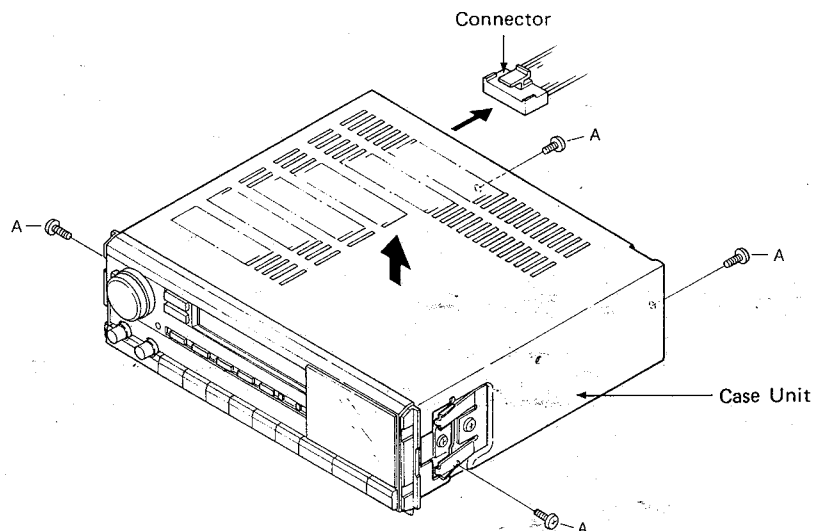


Fig. 28

● Removing the Grille Assy

1. Pull each knob toward you to release it.
2. Remove 4 hooks, then the grille assembly can be removed.

● Removing the Cassette Mechanism Assy

1. Remove 4 screws (B).
2. Pull the connector (20P) out while lifting the cassette mechanism assembly straight up.

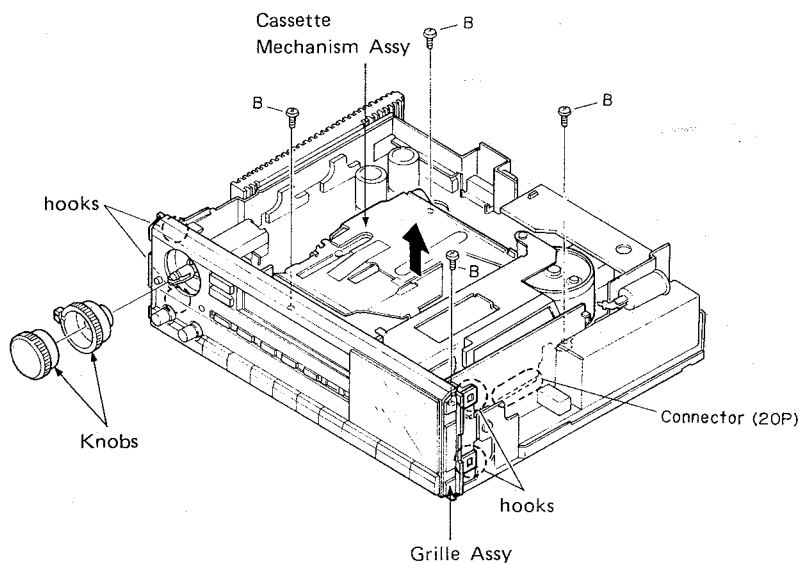


Fig. 29

- Removing the Heat Sink

1. Remove the four screws (C) and remove the heat sink.

- Removing the Protective Circuit Unit

1. Stretch the claw (2 parts).
2. Remove the connector (4P).

- Removing the Main Amp Unit

1. Remove the Button Unit.
2. Remove 2 screws (D).
3. Pull out the connectors (6P, 14P) while lifting the Main Amp Unit straight up.

- Removing the FM Unit

1. Insert a (—) screwdriver and move it toward the arrow, then the connector can be removed.

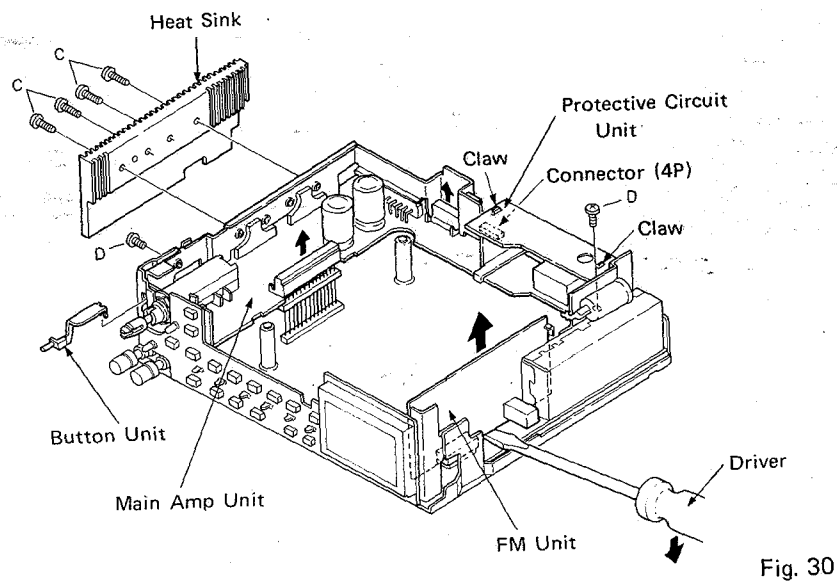


Fig. 30

- Removing the chassis

1. Remove the four screws (F).

- Removing the Switch Unit.

1. Remove the two screws (E).

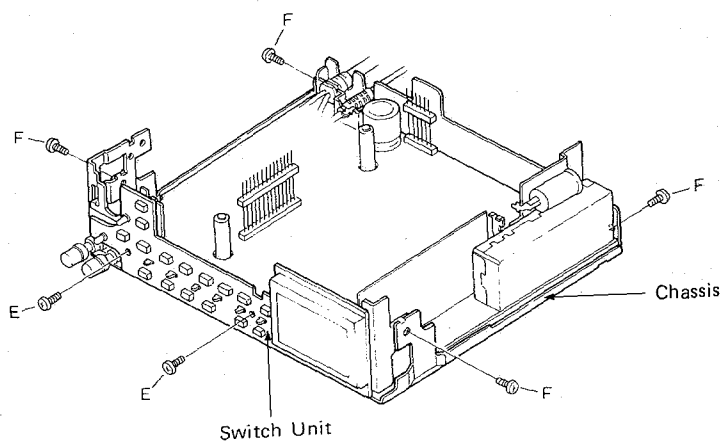


Fig. 31

9. ADJUSTMENT

9.1 HEAD AZIMUTH ADJUSTMENT

• Connection Diagram

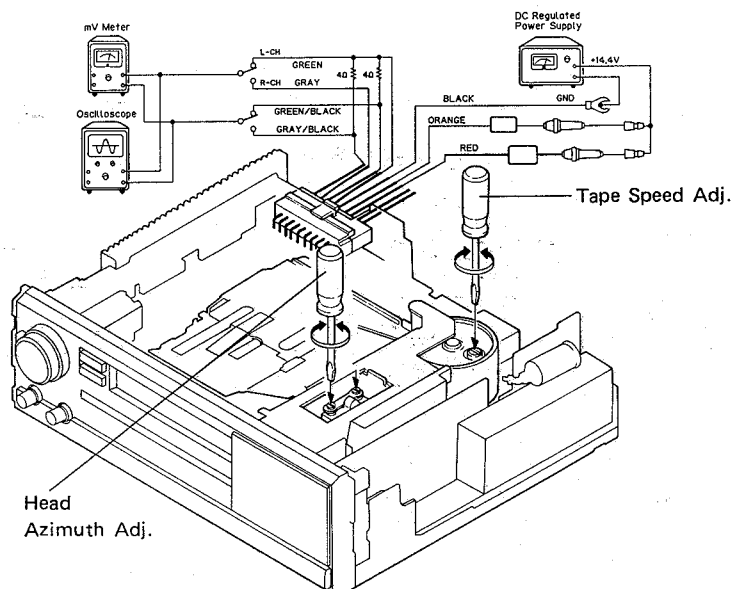


Fig. 32

• To Adjust

1. Play "A" side of STD-341A (10kHz, -20dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

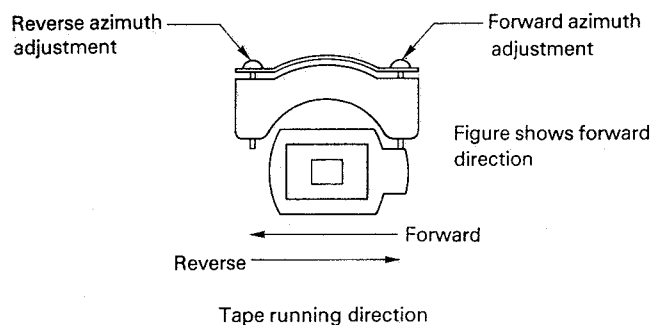


Fig. 33

9.2 TAPE SPEED ADJUSTMENT

• Connection Diagram (shown in Fig. 32)

• To Adjust

1. Reproduce STD-301 (3kHz, -10dB). Adjust the semifixed resistor so that the frequency counter shows 3,010Hz (+30Hz, -30Hz).

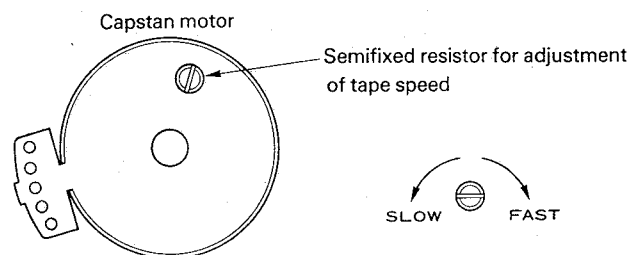


Fig. 34

9.3 Dolby NR LEVEL ADJUSTMENT

● Connection Diagram

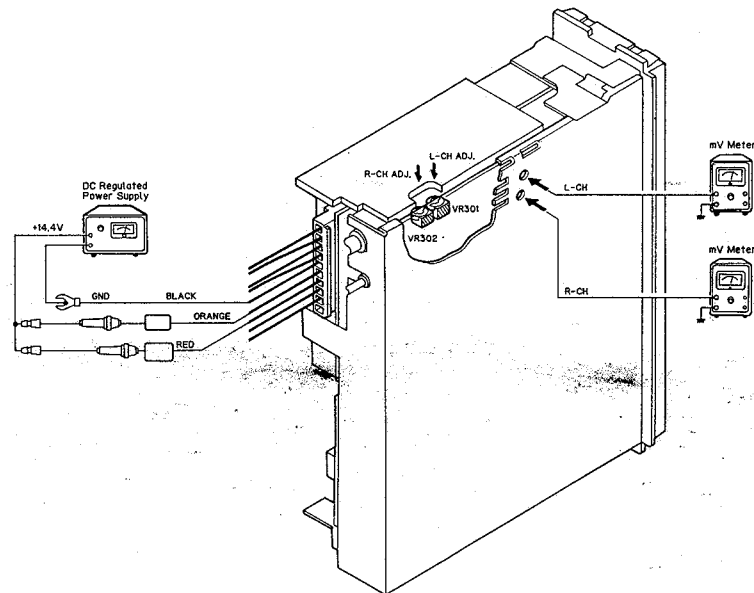


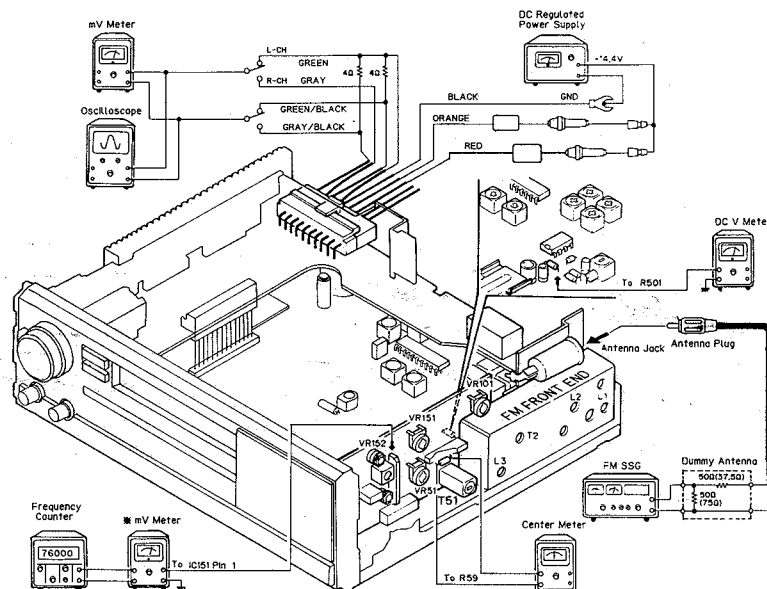
Fig. 35

● To Adjust

1. Set Dolby NR switch in "off" position.
2. Reproduce CT-150 (400Hz, 200nwb/m). Adjust VR 301 (left channel) and VR 302 (right channel) so that the mV meters show 100 mV. Adjustment accuracy should be $\pm 1\text{dB}$. ($100\text{mV} = -17.8\text{dBs}$)

9.4 FM IF ADJUSTMENT

● Connection Diagram



*mV Meter
Input Impedance More than 1M Ω
Input Capacitor Less than 100pF

Fig. 36

● To Adjust

1. Set the Mono switch to MONO.
2. Apply a signal of 98.1 MHz, 400 Hz 30% modulation and 60 dB (μ V) from the FM SSG and tune 98.1 MHz.
3. Adjust T51 to make the center meter show 0.

9.5 FM MPX ADJUSTMENT (KEH-8030/EW, 8020/US, CS, ES)

● Connection Diagram (shown in Fig. 36)

● To Adjust

1. Set the mono switch to MONO.
2. Apply a 98.1MHz, 60dB (μ V) unmodulated signal from FM SSG, then confirm that the frequency counter display is within 76kHz $\pm$ 120Hz.
3. Set the mono switch to AUTO.
4. Adjust VR151 to reduce the oscilloscope wave form to the minimum by only using pilot signal modulation (10%) and 60dB (μ V).
5. Adjust VR101 to obtain the best separation by applying a stereo signal (1KHz, 100% modulation). (Turn VR152 all the way counterclockwise at this time.)
6. Adjust VR152 to obtain 5dB separation by making the input signal 35dB (μ V).

9.6 FM MPX ADJUSTMENT (KEH-8030SDK/WG)

● Connection Diagram (shown in Fig. 36)

● To Adjust

1. Set the mono switch to MONO.
2. Apply a 98.1MHz, 60dB (μ V) unmodulated signal from FM SSG, and confirm that the frequency counter display is within 76kHz $\pm$ 120Hz.
3. Apply a 98.1MHz, 60dB (μ V) MONO signal from FM SSG, then adjust the VOLUME so that the mV meter index becomes 0dB. Then turn input level control VR51 so that the output during 15dB (μ V) becomes -3dB.
4. Set the Mono switch to AUTO.
5. Adjust VR151 to reduce the oscilloscope waveform to the minimum by only using pilot signal modulation (10%) and 60dB (μ V).
6. Adjust VR101 to obtain the best separation by applying a stereo signal (1KHz, 100% modulation). (Turn VR152 all the way counterclockwise at this time.)
7. Adjust VR152 to obtain 5dB separation with a 35dB (μ V) input signal.

9.7 FM TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 36)

- To Adjust (KEH-8030SDK/WG, EW, 8020/ES)

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	108 MHz	L3	7.0 ± 0.2 V	
2.	87.5 MHz		2.0 ± 0.6 V check	
3. 89.9 MHz (400 Hz, 100% modulation) output level 5 ~ 10 dB (μ V)	89.9 MHz	L1, L2		Maximum output
4. 98.1 MHz (400Hz, 100% modulation) output level 5 ~ 10 dB (μ V)	98.1MHz	T2		Maximum output

- To Adjust (KEH-8020/US, CS)

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	107.9 MHz	L3	7.0 ± 0.2 V	
2.	87.9 MHz		2.0 ± 0.6 V check	
3. 89.9 MHz (400 Hz, 100% modulation) output level 5 ~ 10 dB (μ V)	89.9 MHz	L1, L2		Maximum output
4. 98.1 MHz (400 Hz, 100% modulation) output level 5 ~ 10 dB (μ V)	98.1 MHz	T2		Maximum output

9.8 SEEK SENSITIVITY ADJUSTMENT (KEH-8020/US, CS)

- Connection Diagram (shown in Fig. 36)

1. Set the Loc. S switch to DX.
2. Apply a 98.1MHz, 400Hz, 30% modulation signal from FM SSG to perform auto search. Then adjust VR51 so that it stops at 25 ± 5 dB (μ V)

9.9 AM (LW) TRACKING ADJUSTMENT

● Connection Diagram

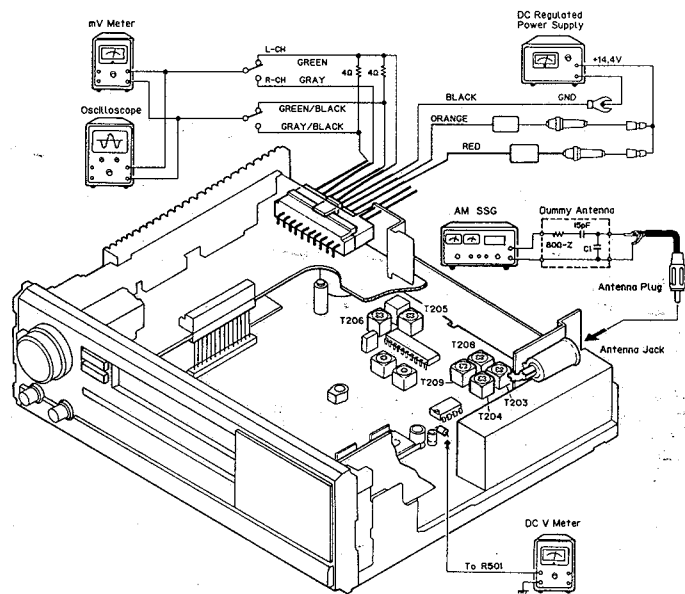


Fig. 37

NOTICE:
Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.
Z: Output impedance of SSG.

● To Adjust (KEH-8030SDK/WG, EW)

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	153 kHz	For Confirmation only	More than 2.5 V	
2. 218 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	218 kHz	T208 T209		Maximum output
3.	281 kHz	For Confirmation Only	Less than 7.0 V	

9.10 AM (MW) TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 37)

- To Adjust (KEH-8030SDK/WG, EW, 8020/ES)

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,602 kHz	For Confirmation only	Less than 7.9 V	
2.	531 kHz	For Confirmation only	More than 0.8 V	
3. 603 kHz (400 Hz, 30% modulation) output level 25 dB (μ V)	603 kHz	T203, T204 T205, T206		Maximum output
4. 603 kHz 999 kHz (400 Hz, 30% modulation) 1,395 kHz output level 35 dB (μ V)	603 kHz 999 kHz 1,395 kHz	For Confirmation Only		The difference between the maximum and minimum output levels at 603 kHz, 999 kHz, and 1,395 kHz must be 6 dB or less.

To Adjust (KEH-8020/US, CS)

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,620 kHz	For Confirmation only	Less than 7.9 V	
2.	530 kHz	For Confirmation only	More than 0.8 V	
3. 600 kHz (400 Hz, 30% modulation) output level 25 dB (μ V)	600 kHz	T203, T204 T205, T206		Maximum output
4. 600 kHz 1,000 kHz (400 Hz, 30% modulation) 1,400 kHz output level 35 dB (μ V)	600 kHz 1,000 kHz 1,400 kHz	For Confirmation Only		The difference between the maximum and minimum output levels at 600 kHz, 1,000 kHz, and 1,400 kHz must be 6 dB or less.

9.11 REFERENCE OSCILLATION FREQUENCY ADJUSTMENT

● Connection Diagram

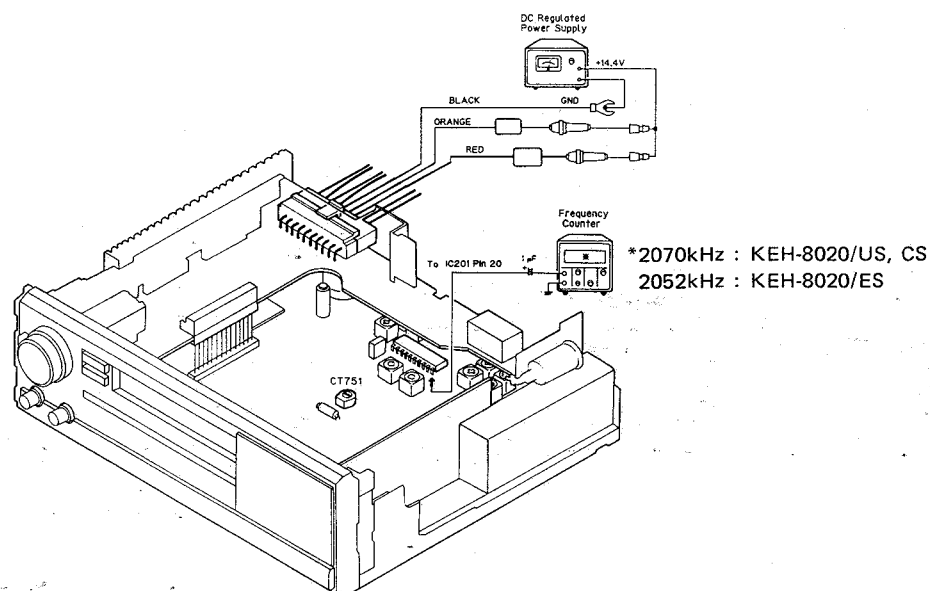


Fig. 38

● To Adjust (KEH-8020/US, CS)

1. Set the AM position.
2. Set the LCD display to 1620KHz.
3. Adjust CT751 so that the frequency counter display becomes $2070\text{kHz} \pm 10\text{Hz}$.

● To Adjust (KEH-8020/ES)

1. Set the AM position.
2. Set the LCD display to 1602KHz.
3. Adjust CT751 so that the frequency counter display becomes $2052\text{kHz} \pm 10\text{Hz}$.

9.12 SDK DECODER ADJUSTMENT (KEH-8030SDK/WG)

● Connection Diagram

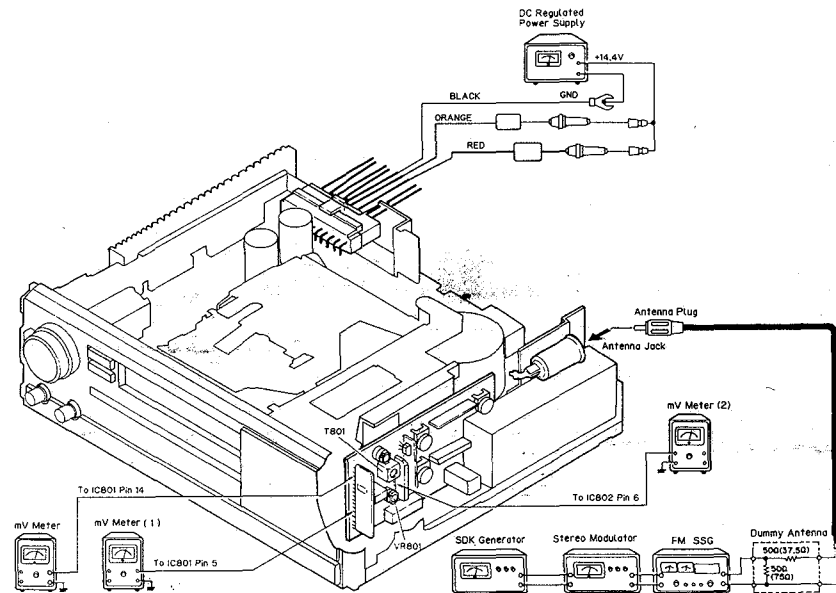


Fig. 39

● To Adjust

1. Set the FM SSG as follows.

- Carrier: 98.1MHz, 60dB (μ V)
- Modulation (audio): 400Hz, 60%
- Modulation (SK): 57KHz, 5%
- Modulation (DK): 125Hz, 30%

[57KHz filter adjustment]

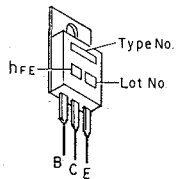
2. Apply an SK signal (57KHz, 5%) and adjust T801 so that the mV meter index is maximum.

[DK Schmidt level adjustment]

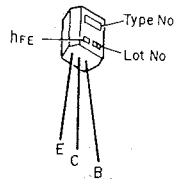
3. Apply DK (125Hz, 30%) and SK (57KHz, 5%) signals, then adjust VR801 so that the level difference between mV meter (1) and mV meter (2) becomes 1.5 dB.

● ICs and Transistors

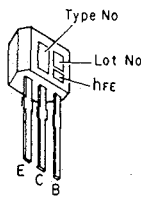
2SB941



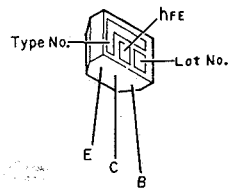
2SA1150
2SC2458
2SA1048
2SC1740S



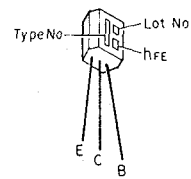
2SC536SP



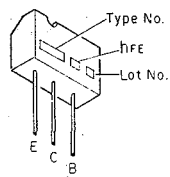
2SD1468S



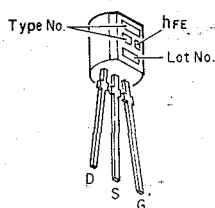
2SD1012



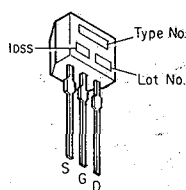
2SD1055F
2SC2021F



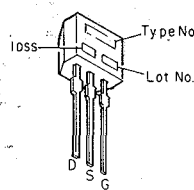
2SK435



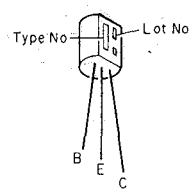
2SK330



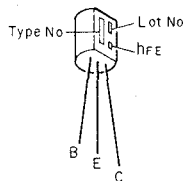
2SK241



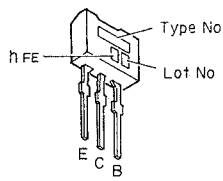
2SC2753



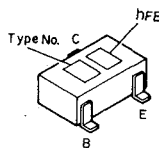
2SC2570



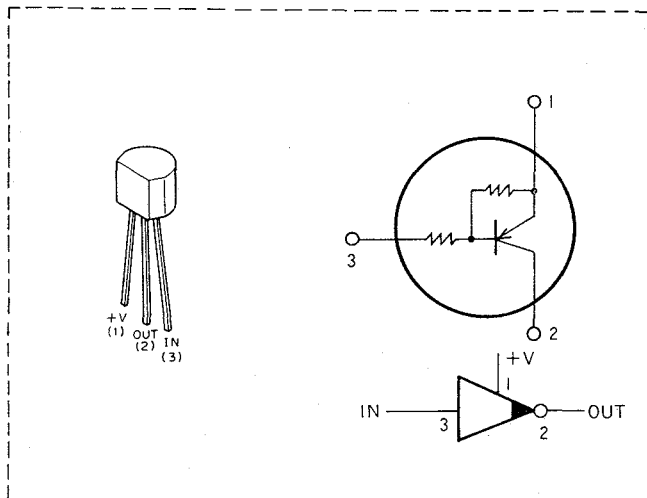
2SB1066MF



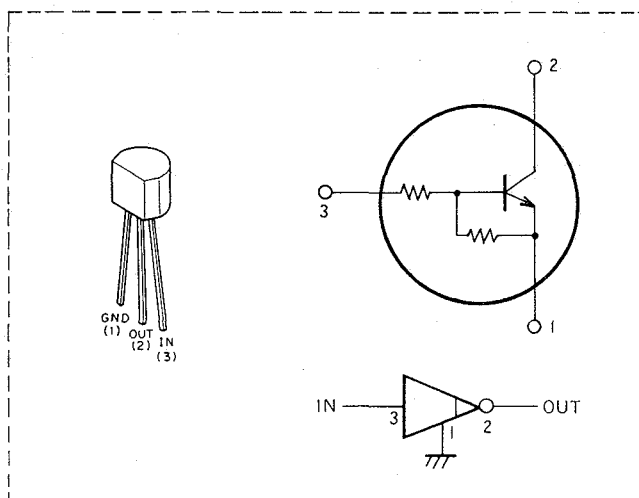
Parts No.	Indication (Type No., hFE)
2SC2712-LG	LG
2SC2712-LL	LL
2SC2712-LY	LY
2SD601-YQ	YQ
2SD601-YR	YR
2SD601-YS	YS



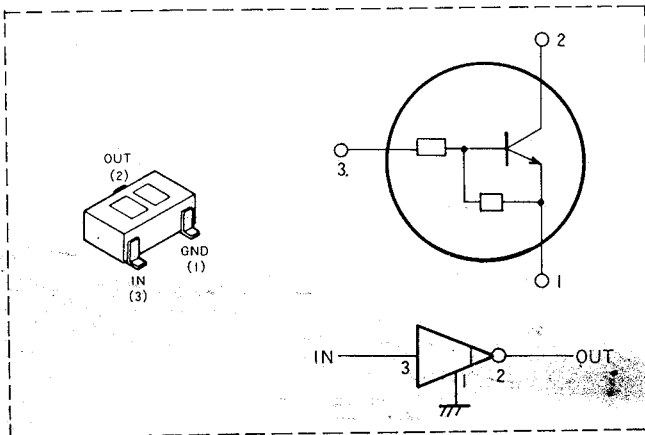
DTA114ES,
DTA124ES, DTA144ES, UN4111, UN4113



DTC124ES, UN4212

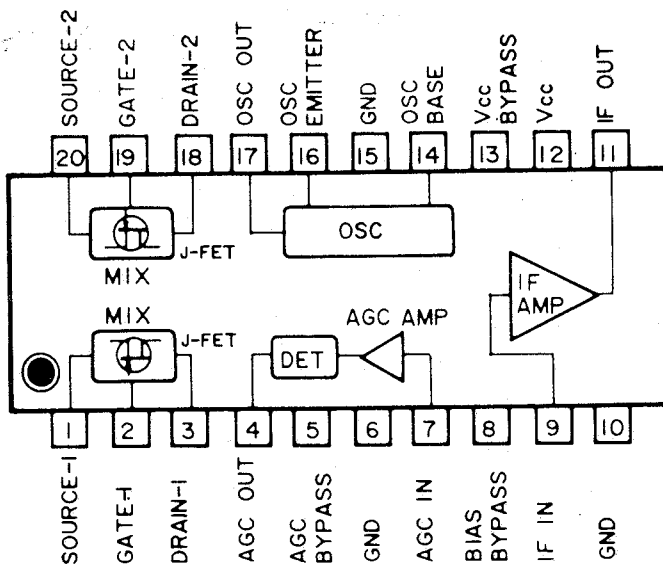


UN2216, DTC143TK
Chip transistor

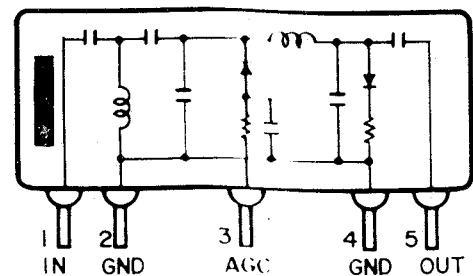


• FM Front End

IC2 : PA4009

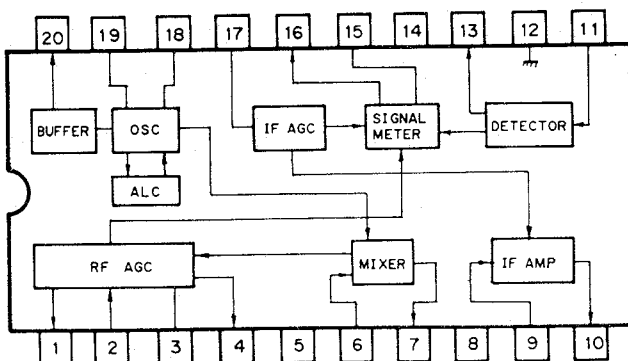


IC1 : CWW-173
CWW1015

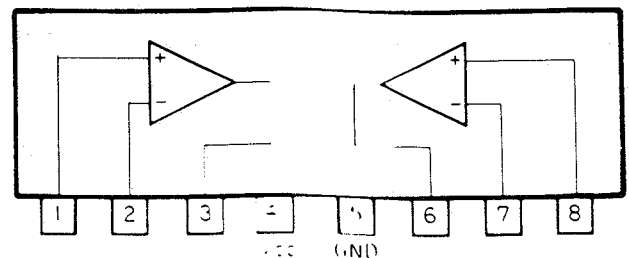


• Tuner Unit

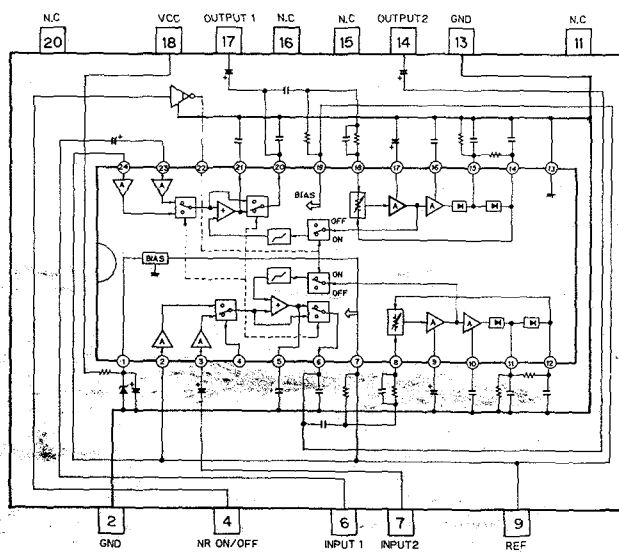
IC201 : LA1135



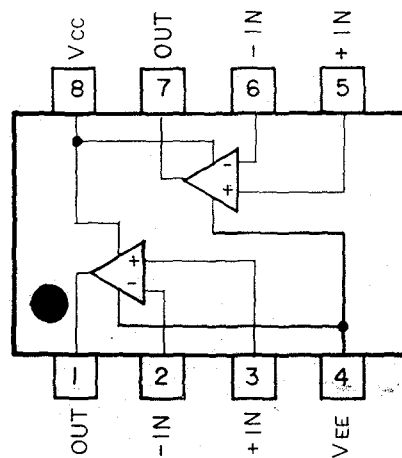
IC251 : M51522AL



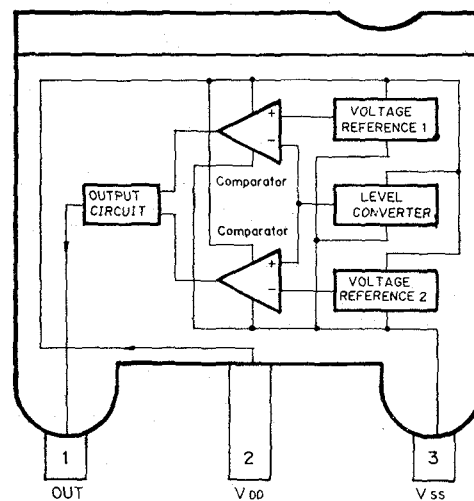
IC301 : KHA501



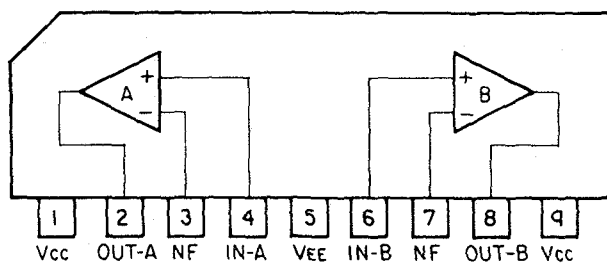
IC451 : NJM4558S



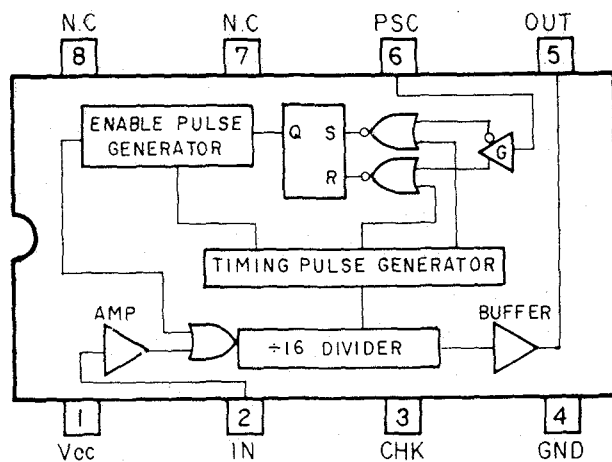
IC752 : MN1280



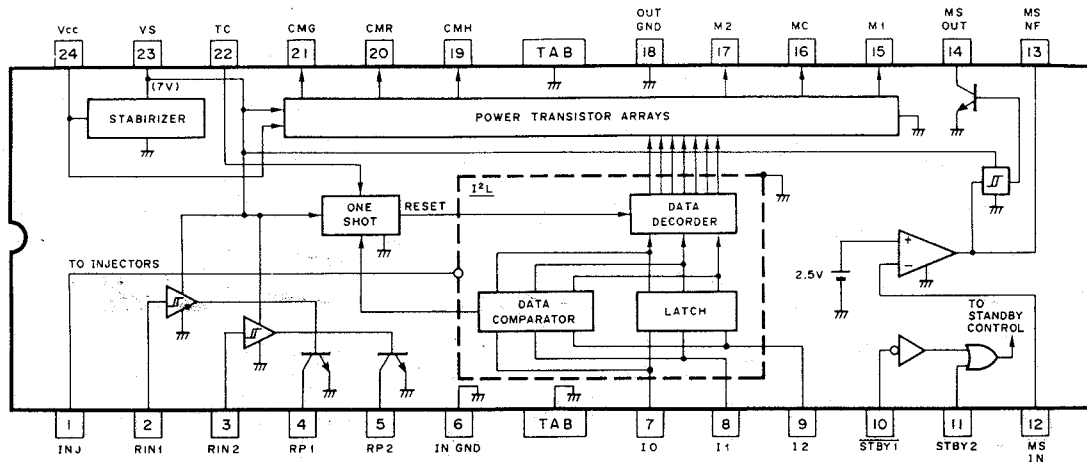
IC351 : TA75558S



IC501 : μ PB553AC



IC701 : PA3019

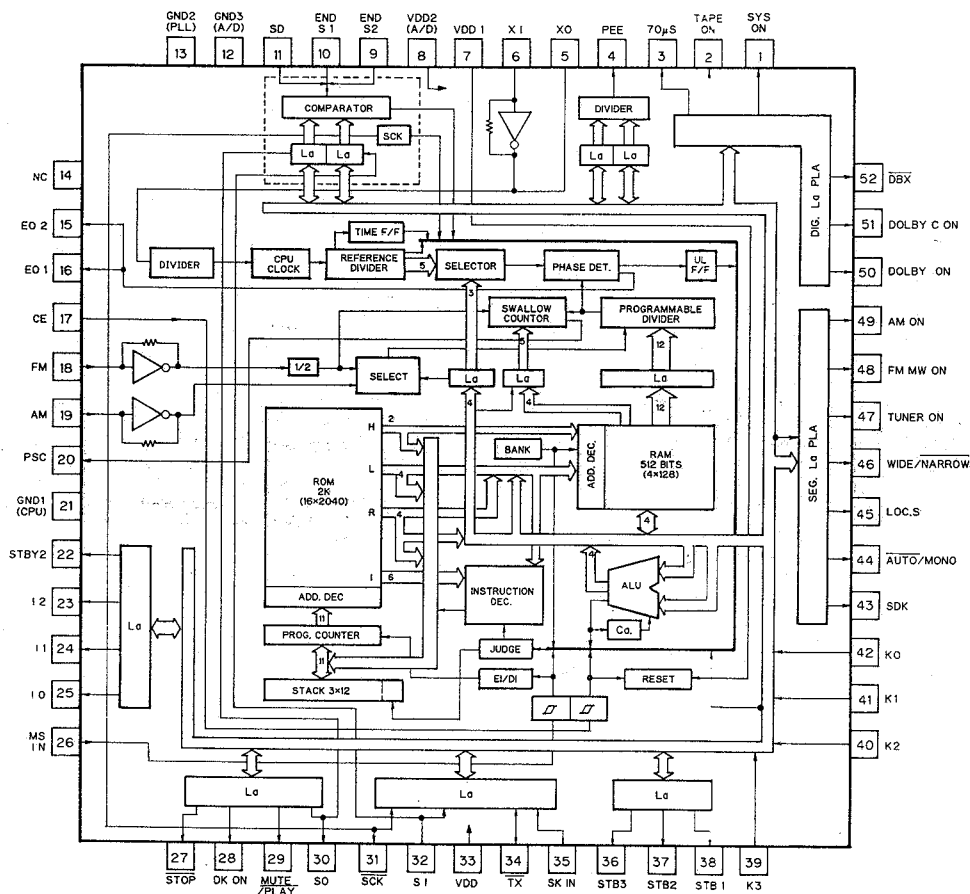


● Pin Functions (PA3019) (Deck Driver)

Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	"Internal logic" (I ² L) power source
2	RIN1	Input	Input pin for reel unit rotation sensor (MR 1)
3	RIN2	Input	Input pin for reel unit rotation sensor (MR 2)
4	RP1	Output	Output for wave form signal from reel sensor input 1 (pin 2)
5	RP2	Output	Output for wave form signal from reel sensor input 2 (pin 3)
6	IN GND	—	Low signal system ground pin
7	I0	Input	Motor control logic input pin
8	I1	Input	
9	I2	Input	
10	STBY1	Input	Standby control — switches IC power circuit off at active low (0.7V or less).
11	STBY2	Input	Standby control — switches IC power circuit off at active high (3.5V or more).
12	MSIN	Input	Input (inverted) pin for MS amp.
13	MSNF	Output/ Input	MS amp. output and MS Schmitt circuit input
14	MSOUT	Output	MS Schmitt circuit output — when signal level at MSNF pin exceeds 0 dBm, pulse is outputted open when below 0 dBm
15	M1	Output	Drive output "+" pin for head drive motor M1
16	MC	Output	Drive output common pin for motors M1 and M2
17	M2	Output	Drive output "+" pin for drive motor M2 ("FF/REW" switching gear)
18	OUT GND	—	Motor drive circuit ground pin
19	CMH	Output	Drive output H (+) pin for capstan motor M3 output voltage: During speed control: app. V _{cc} –1.7V During loading and eject: 6.9V
20	CMR	Output	Drive output R pin for capstan motor M3 During speed control: open During loading: app. 0V During eject: app. 7V
21	CMG	Output	Drive output GND (–) pin for capstan motor M3 During speed control: app. 0V During loading and eject: open
22	TC	Output	Pin for capacitor for setting timer to switch power transistor off in a set time when logic inputs I0, I1, I2 change.
23	VS	Output	Power source for reel rotation sensor — app. 7V
24	Vcc	Input	IC power supply pin

*IC751 : PD4077C

IC's marked by * are MOS type.
Be careful in handling them because they are very
liable to be damaged by electrostatic induction.



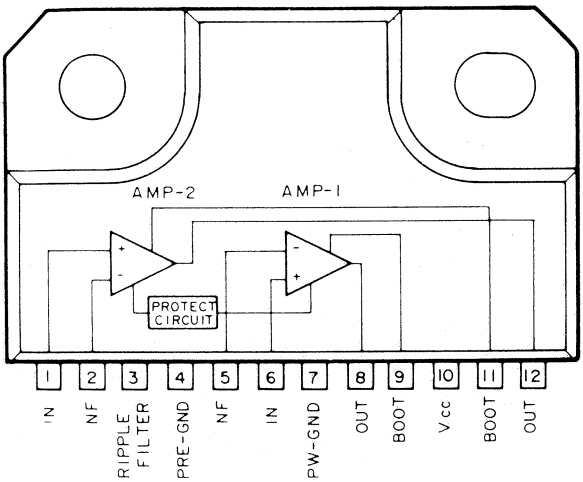
● PD4077C Pin Functions (Deck Tuner Controller)

Pin No.	Pin Name	I/O	Function and Operation
1	SYS ON	OUT	HIGH when TAPE, TUNER or AUX (CD) is on.
2	TAPE ON	OUT	HIGH during TAPE operation
3	70μS	OUT	HIGH during TAPE mode and metal tape detection
4	PEE	OUT	Outputs Pee sound and SKD alarm sound.
5	XO		Crystal oscillator (4.5MHz) connection terminal
6	XI		
7	VDD1		Power supply terminal
8	VDD2		
9	ENDS2	IN	Reel rotation detection terminal. Detects IC701 (PA3019) pulse output.
10	ENDS1	IN	
11	SD	IN	Stop input terminal during seek and scan operation. Seek and scan stops during HIGH.
12	GND3		GND
13	GND2		
14	NC		No Connection

Pin No.	Pin Name	I/O	Function and Operation
15	E02	OUT	PLL error output terminal When the divided oscillation frequency is higher than the reference frequency, HIGH output occurs from this terminal. When the frequency is lower, LOW output occurs. When they match, floating occurs.
16	E01	OUT	
17	CE	IN	Device selection signal input terminal
18	FM	IN	FM programmable counter input terminal Inputs FM local oscillation (VCO) output divided into 1/16, 1/17 by a prescaler (μPB553AC).
19	AM	IN	AM programmable counter input terminal Inputs AM local oscillation (VCO) output
20	PSC	OUT	Controls prescaler frequency division switching (1/16, 1/17)
21	GND1		GND
22	STBY2	OUT	Outputs data to IC701 (PA3019) Standby status with HIGH I ₂ - I ₀ are motor control logic output terminals
23	I2	OUT	
24	I1	OUT	
25	I0	OUT	
26	MS IN	IN	Tape interim music detection terminal. Detects pulse output from IC701 (PA3019) to decide music or no music.
27	STOP	OUT	Capstan motor control terminal Capstan motor stops with LOW.
28	DK ON	OUT	HIGH during SDK and DK signal reception (KEH-8030SDK/WG)
29	MUTE/PLAY	OUT	LOW during PLAY operation HIGH otherwise and during mute operation
30	SO	OUT	Serial output terminal
31	SCK	IN/OUT	Serial output terminal
32	SI	IN	Serial input terminal
33	VDD		Power supply terminal
34	TX	IN/OUT	Communication with others, disabled with LOW output during communication.
35	SK IN	IN	SK signal input terminal during SDK.
36	STB3	OUT	When the cassette mechanism status changes, a strobe is outputted for the status detection key matrix. High impedance in a steady state
37	STB2	OUT	
38	STB1	OUT	
39	K3	IN	Cassette mechanism status detection key input terminal
40	K2	IN	
41	K1	IN	
42	K0	IN	
43	SDK	OUT	HIGH during SDK ON (KEH-8030SDK/WG)
44	AUTO/MONO	OUT	Auto status with LOW during Tuner mode
45	LOC.S	OUT	HIGH during local search
46	WIDE/NARROW	OUT	WIDE status with HIGH
47	TUNER ON	OUT	No Connection
48	FM MW ON	OUT	HIGH during FM or MW
49	AM ON	OUT	HIGH during MW or LW
50	DOLBY ON	OUT	HIGH during Dolby ON.
51	DOLBY C ON	OUT	No Connection
52	DBX	OUT	No Connection

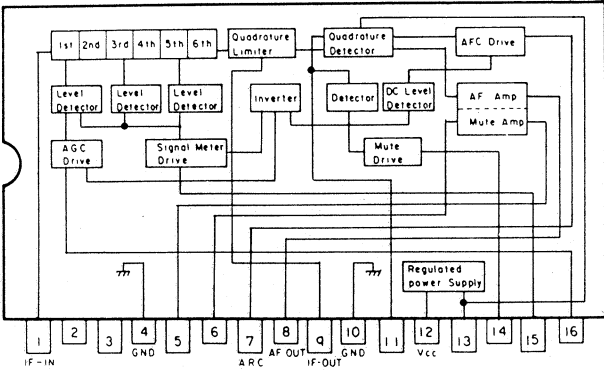
● Main Amp Unit

IC551, 552 : TA7270P

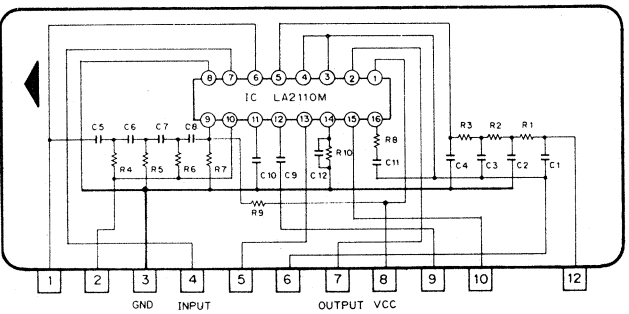


● FM Unit

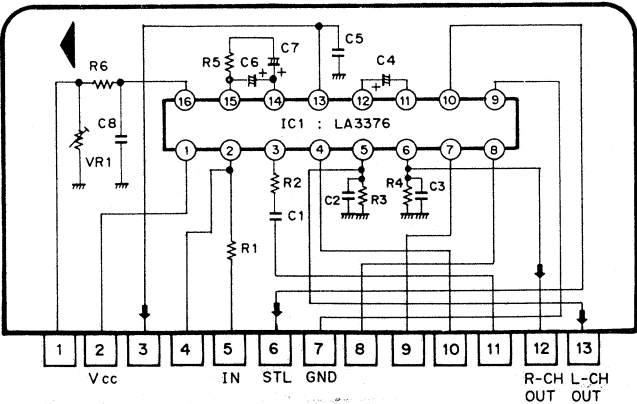
IC51 : LA1140B



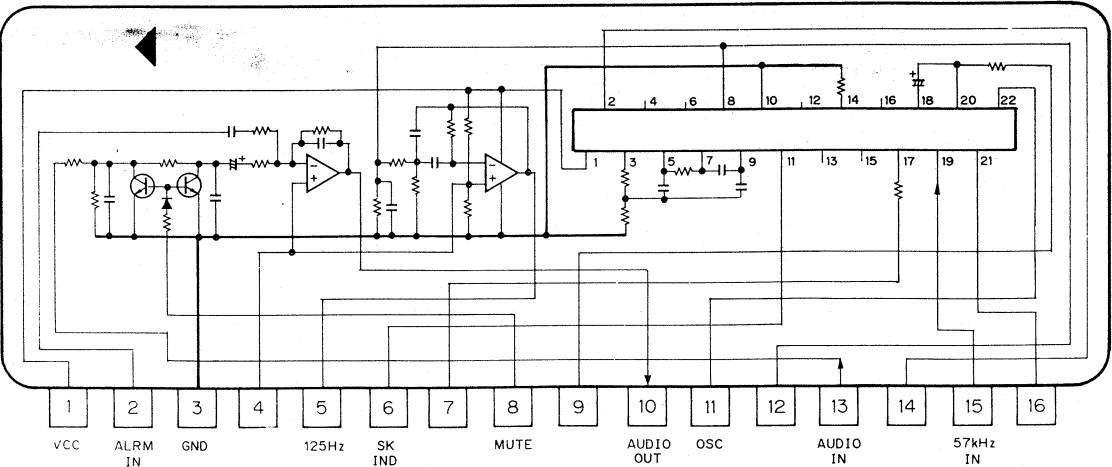
IC101 : KHA115



IC151 : MX3S400

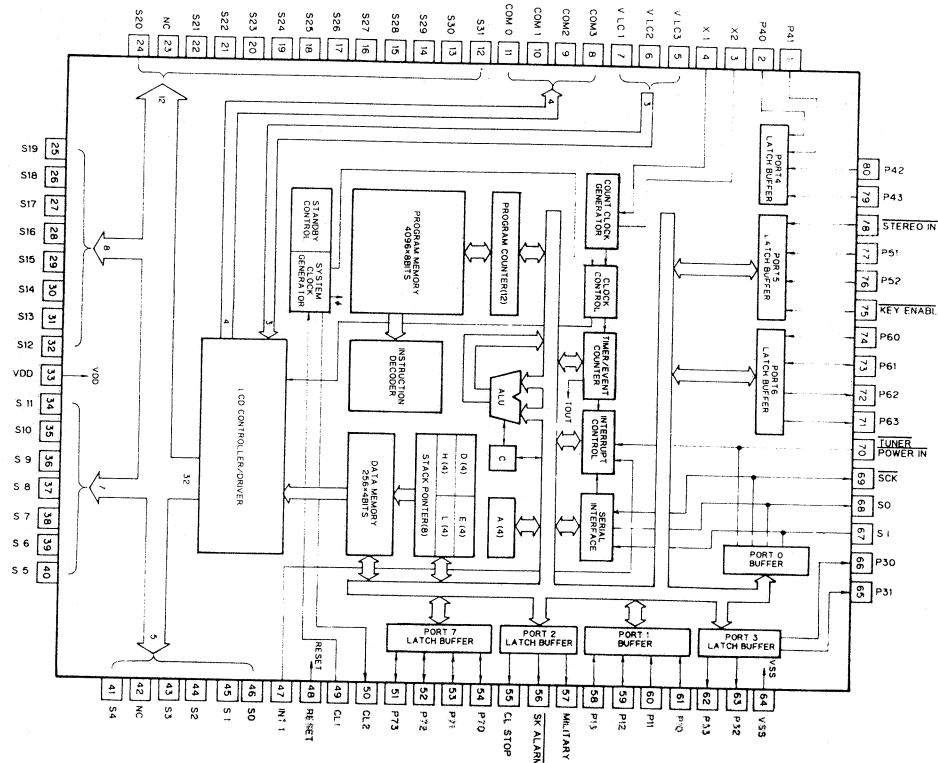


IC801 : KHA132



● Switch Unit

*IC901 : PD4078C



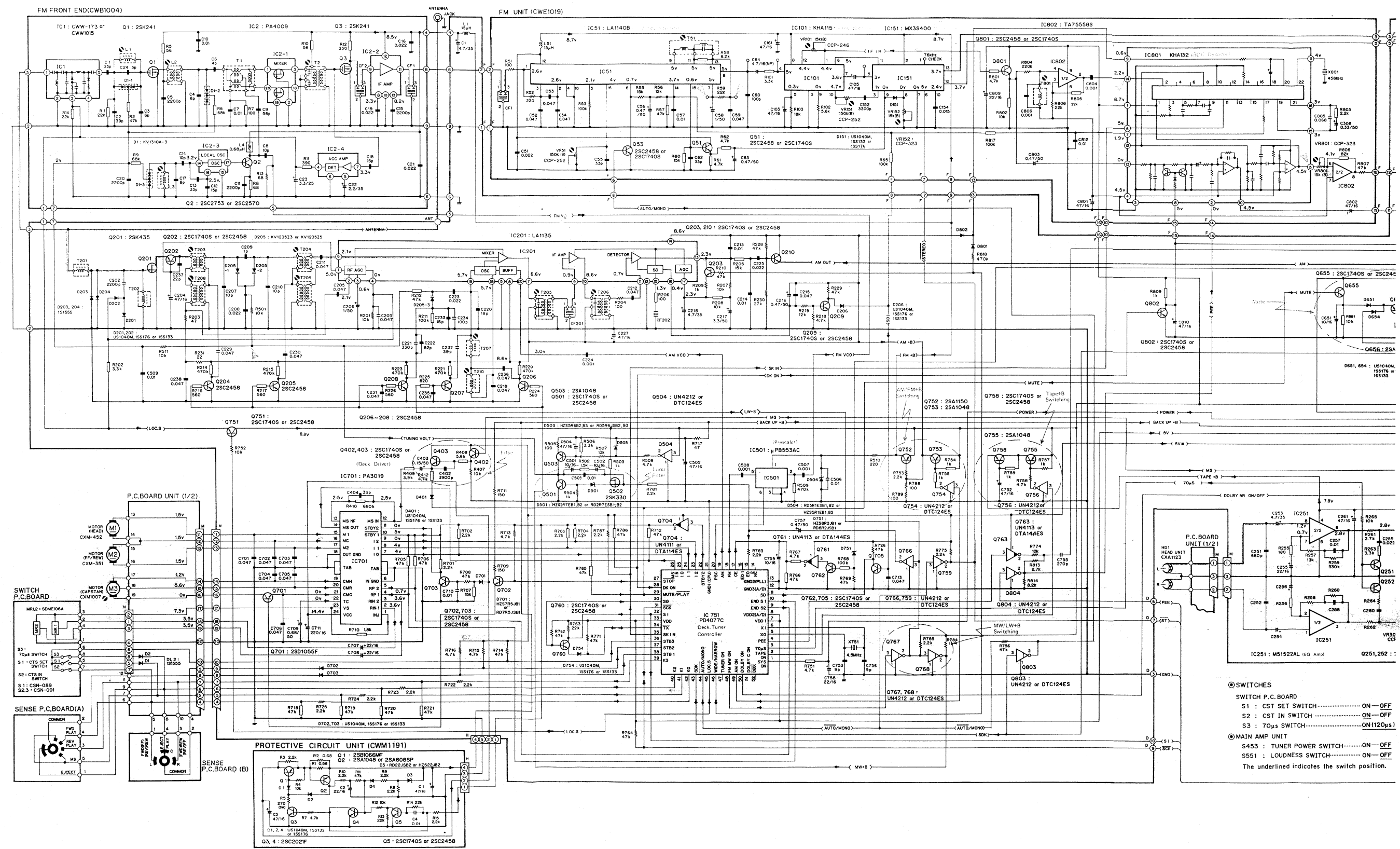
IC's marked by * are MOS type.
Be careful in handling them because they are very
liable to be damaged by electrostatic induction.

● PD4078C Pin Functions (Key · Display controller)

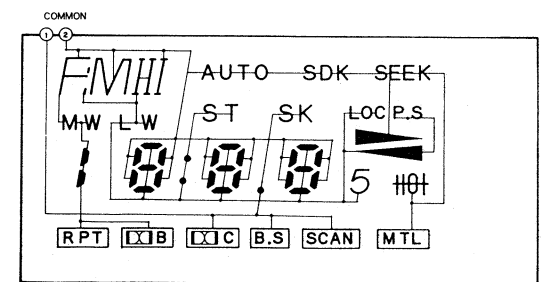
Pin No.	Pin Name	I/O	Function and Operation
1	P41	IN	Key Return Input.
2	P40	IN	
76	P52	IN	
77	P51	IN	
79	P43	IN	
80	P42	IN	Crystal oscillator (32.768KHz) connection terminal
3	X2	OUT	
4	X1	IN	
5	VLC3	IN	LCD reference voltage selection terminal
6	VLC2	IN	
7	VLC1	IN	
8	COM3	OUT	No Connection
9	COM2	OUT	
10	COM1	OUT	
11	COM0	OUT	LCD Common output.
12	S31	OUT	Segment signal output terminal that directly drives an LCD segment terminal (front electrode).
22	S21	OUT	
24	S20	OUT	
32	S12	OUT	
34	S11	OUT	
38	S7	OUT	

Pin No.	Pin Name	I/O	Function and Operation																									
23	NC		No Connection																									
33	VDD		Power supply terminal																									
39 46	S6 S0	OUT OUT	No Connection																									
47	INT1	IN	DK signal (125Hz) input terminal (KEH-8030SDK/WG)																									
48	RESET	IN	Reset input terminal. Active HIGH.																									
49	CL1	IN	System clock oscillation CR connection terminal																									
50	CL2	OUT																										
51	P73	IN/OUT	Initial selection terminal. Just after reset, it is used for the following function selection as an input port. However, it changes to an output port after that. <table><tr><th>P73</th><th>P72</th><th>P71</th><th>P70</th><th>Function selection</th></tr><tr><td>H</td><td>—</td><td>—</td><td>—</td><td>Non quick release</td></tr><tr><td>L</td><td>—</td><td>—</td><td>—</td><td>Quick release</td></tr><tr><td>—</td><td>L</td><td>—</td><td>—</td><td>Scan key</td></tr><tr><td>—</td><td>—</td><td>L</td><td>H</td><td>Dolby NR B & C</td></tr></table>	P73	P72	P71	P70	Function selection	H	—	—	—	Non quick release	L	—	—	—	Quick release	—	L	—	—	Scan key	—	—	L	H	Dolby NR B & C
P73	P72	P71		P70	Function selection																							
H	—	—		—	Non quick release																							
L	—	—		—	Quick release																							
—	L	—		—	Scan key																							
—	—	L	H	Dolby NR B & C																								
52	P72	IN/OUT																										
53	P71	IN/OUT																										
54	P70	IN/OUT																										
55	CL STOP	OUT	HIGH during clock stop																									
56	SK ALARM	OUT	For BEEP volume during SK alarm																									
57	MILITARY	OUT	Crystal oscillator (X901) oscillation stop use																									
58	P13	IN	Destination selection input terminal <table><tr><th>P13</th><th>P12</th><th>P11</th><th>Destination</th></tr><tr><td>H</td><td>H</td><td>H</td><td>US, CA, CS Model</td></tr><tr><td>H</td><td>H</td><td>L</td><td>ES Model</td></tr><tr><td>H</td><td>L</td><td>H</td><td>SDK/WG Model</td></tr><tr><td>H</td><td>L</td><td>L</td><td>EW Model</td></tr><tr><td>L</td><td>L</td><td>H</td><td>G Model</td></tr></table>	P13	P12	P11	Destination	H	H	H	US, CA, CS Model	H	H	L	ES Model	H	L	H	SDK/WG Model	H	L	L	EW Model	L	L	H	G Model	
P13	P12	P11		Destination																								
H	H	H		US, CA, CS Model																								
H	H	L		ES Model																								
H	L	H	SDK/WG Model																									
H	L	L	EW Model																									
L	L	H	G Model																									
59	P12	IN																										
60	P11	IN																										
61	P10	IN	No Connection																									
62	P33	OUT	Key scan, LED display DIGIT output terminal																									
63	P32	OUT																										
65	P31	OUT																										
66	P30	OUT																										
64	VSS		GND																									
67	SI	IN	Serial data input terminal																									
68	SO	OUT	Serial data output terminal																									
69	SCK	IN/OUT	Serial clock I/O terminal																									
70	TUNER POWER IN	IN	LOW level input during tuner power on																									
71	P63	OUT	LED segment output terminal																									
72	P62	OUT																										
73	P61	IN	Initial selection terminal <table><tr><th>P61</th><th>P60</th><th>Function selection</th></tr><tr><td>—</td><td>L</td><td>B. SKIP key</td></tr><tr><td>L</td><td>—</td><td>RPT key</td></tr></table>	P61	P60	Function selection	—	L	B. SKIP key	L	—	RPT key																
P61	P60	Function selection																										
—	L	B. SKIP key																										
L	—	RPT key																										
74	P60	IN																										
75	KEY ENABL	IN	Key accept with LOW (during ACC ON)																									
78	STEREO IN	IN	LOW during stereo																									

10. SCHEMATIC CIRCUIT DIAGRAM (KEH-8030SDK/WG)

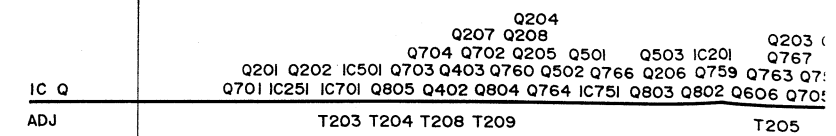
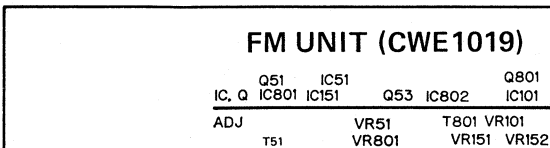
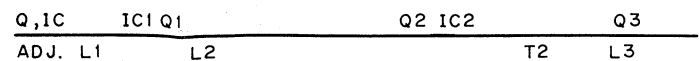


- ⊙ SWITCHES
- SWITCH P.C. BOARD
- S1 : CTS SET SWITCH.....ON-OFF
- S2 : CTS IN SWITCH.....ON-OFF
- S3 : 70μS SWITCH.....ON(120μs)
- ⊙ MAIN AMP UNIT
- S453 : TUNER POWER SWITCH.....ON-OFF
- S551 : LOUDNESS SWITCH.....ON-OFF
- The underlined indicates the switch position.



1 | 2 | 3 | 4 | 5 | 6

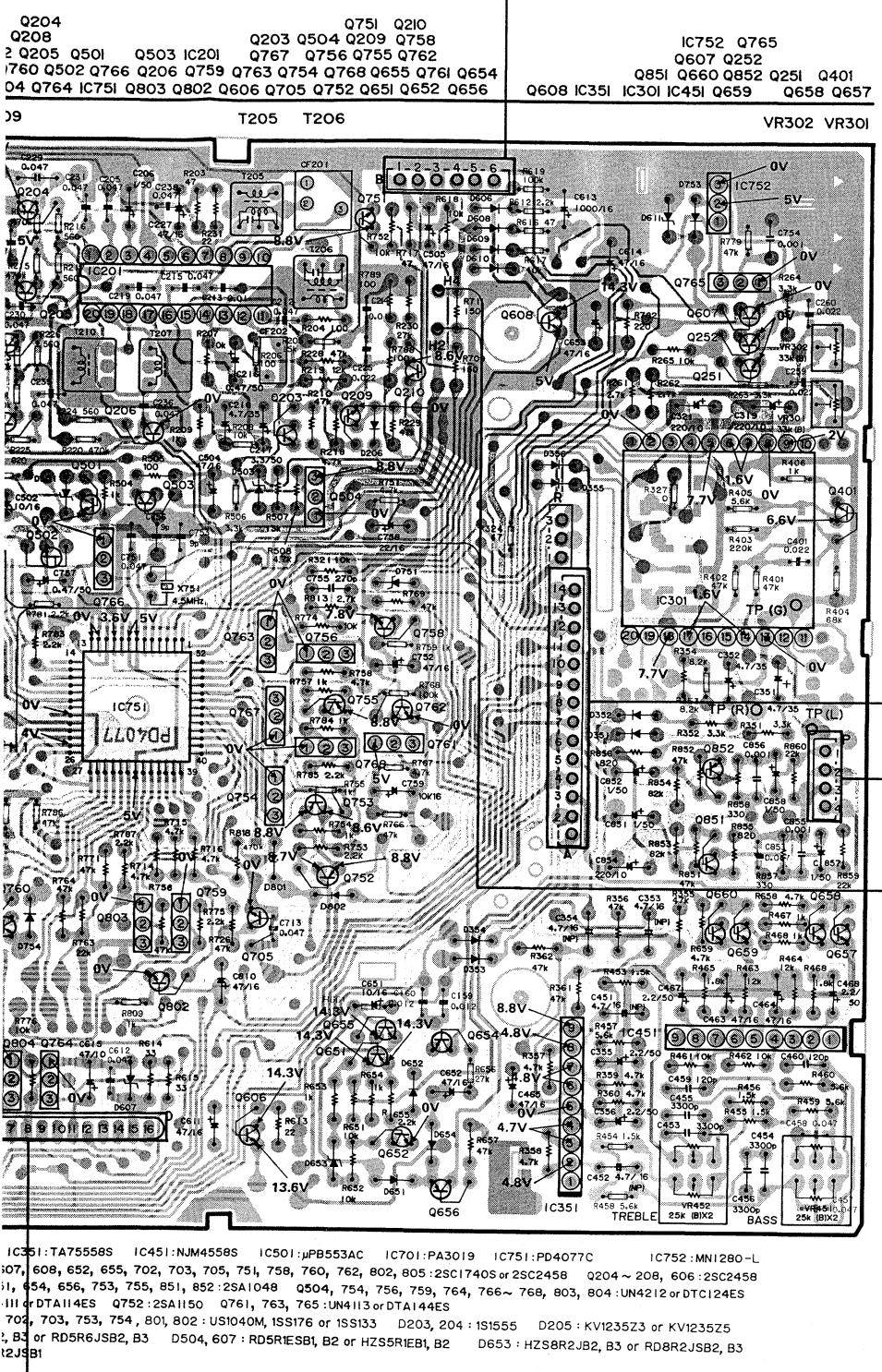
ANTENNA JACK



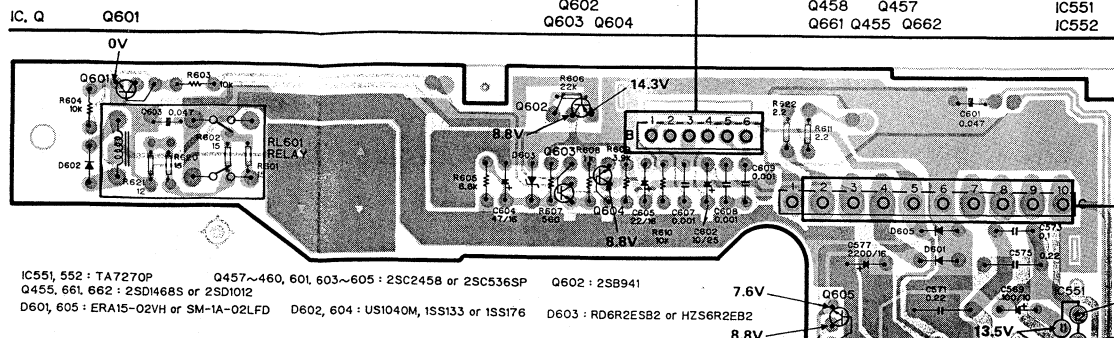
FM FRONT END IC2

FM UNIT IC51FM UNIT IC151FM UNIT I

TUNER UNIT (CWE1029)



MAIN AMP UNIT (CWH1019)

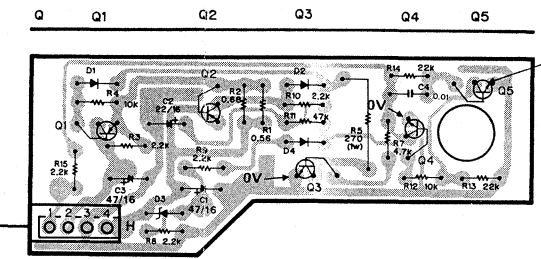


TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5.0V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

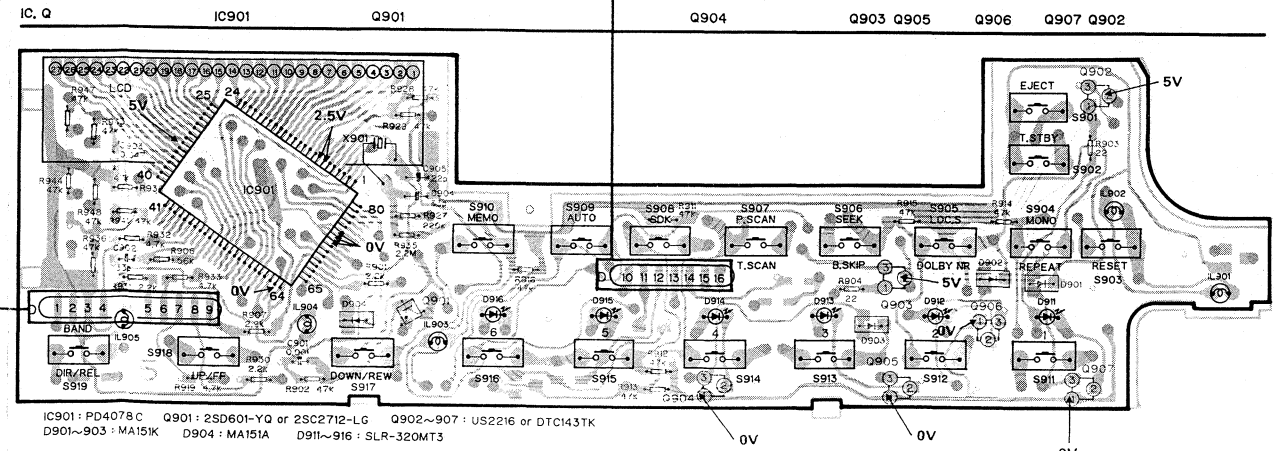
TUNER UNIT IC451

1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	



PROTECTIVE CIRCUIT UNIT (CWM1191)

SWITCH UNIT (CWS1030)



FM UNIT IC801

1	2	3	4	5	6	7	8
8.7V	0V	0V	4.5V	4.5V	5V	1.9V	5V
9	10	11	12	13	14	15	16
0.6V	4.5V	4V		0V	2.2V	3V	3V

FM UNIT IC802

5	6	7	9
0V	4.1V	4.5V	8.7V

A

B

C

D

7

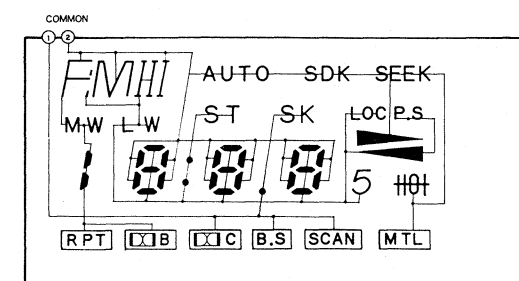
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9

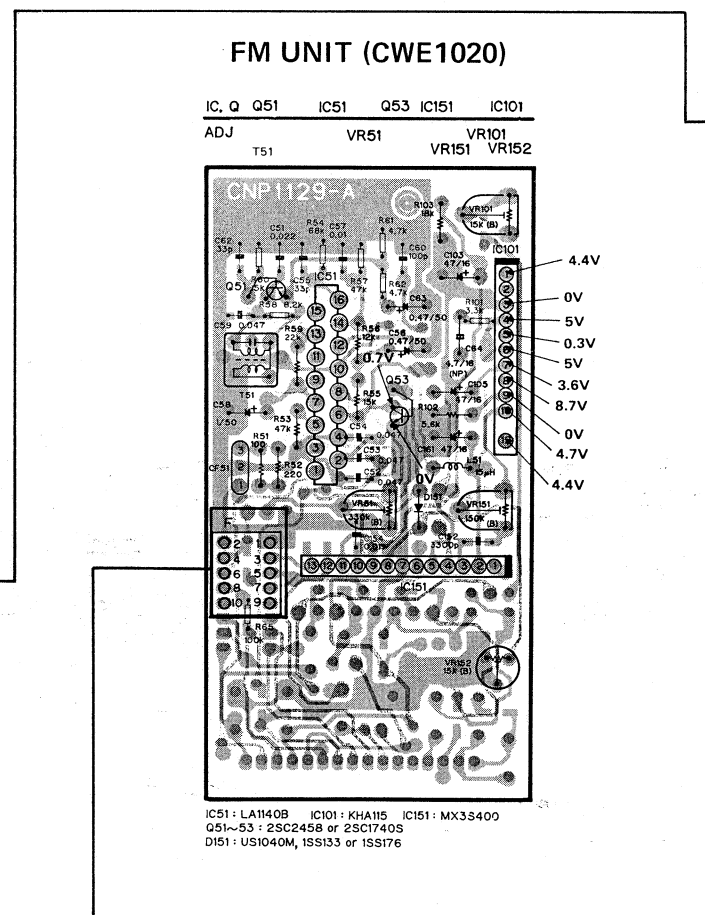
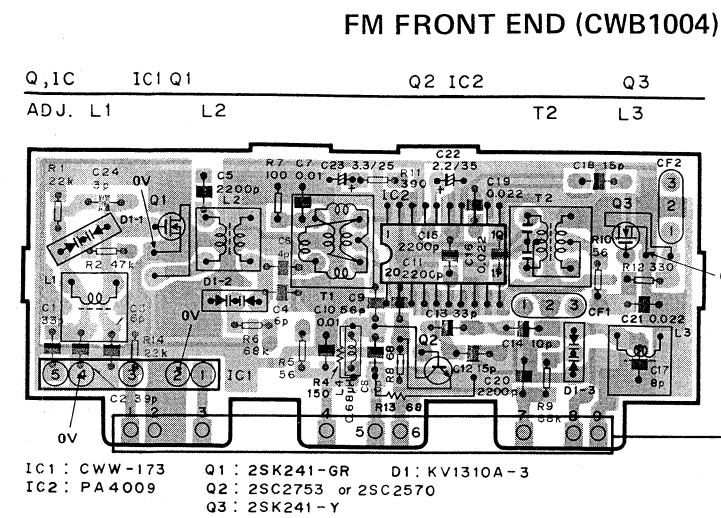
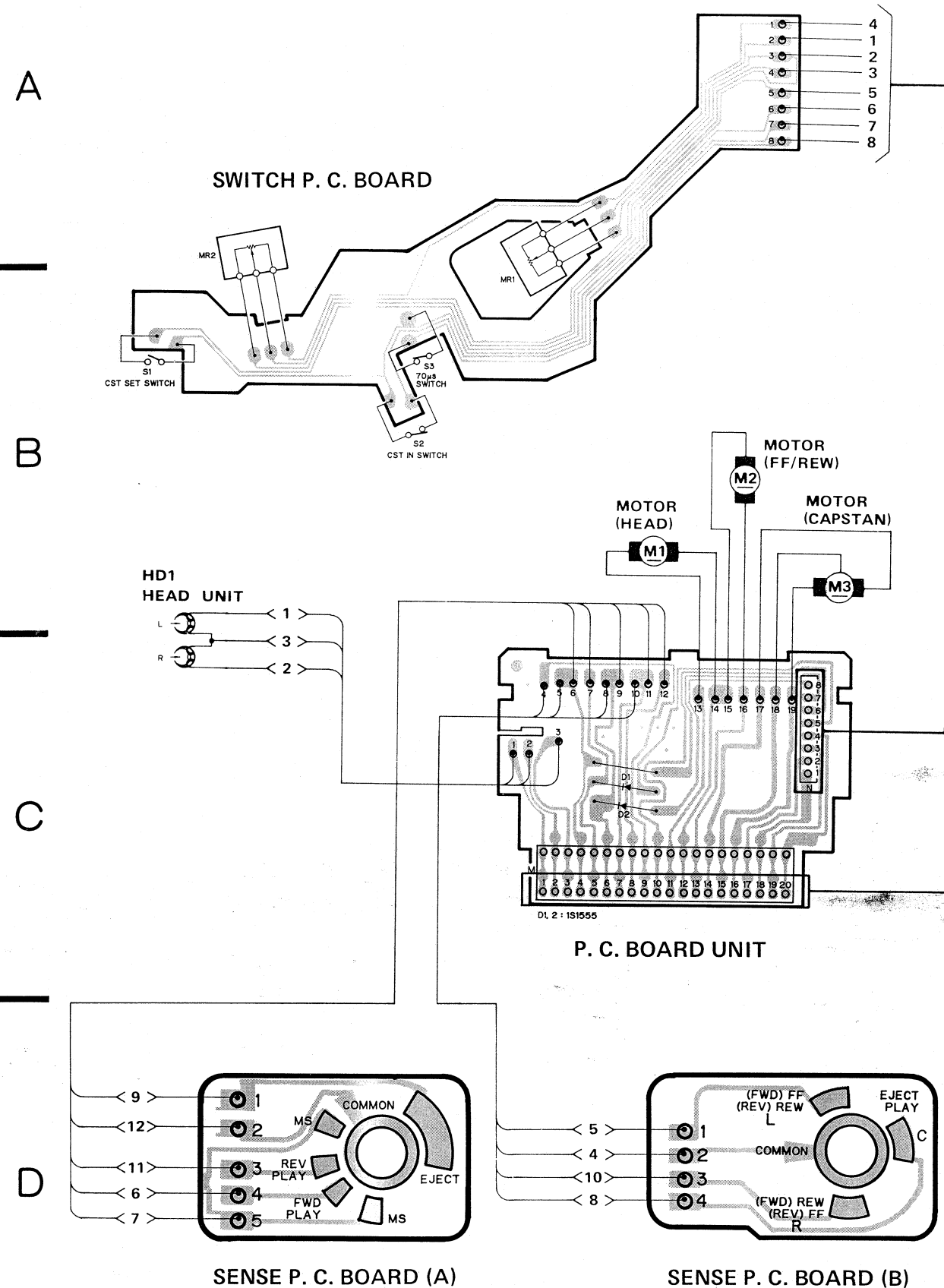
10

11

12



13. CONNECTION DIAGRAM (KEH-8030/EW)



FM FRONT END IC2

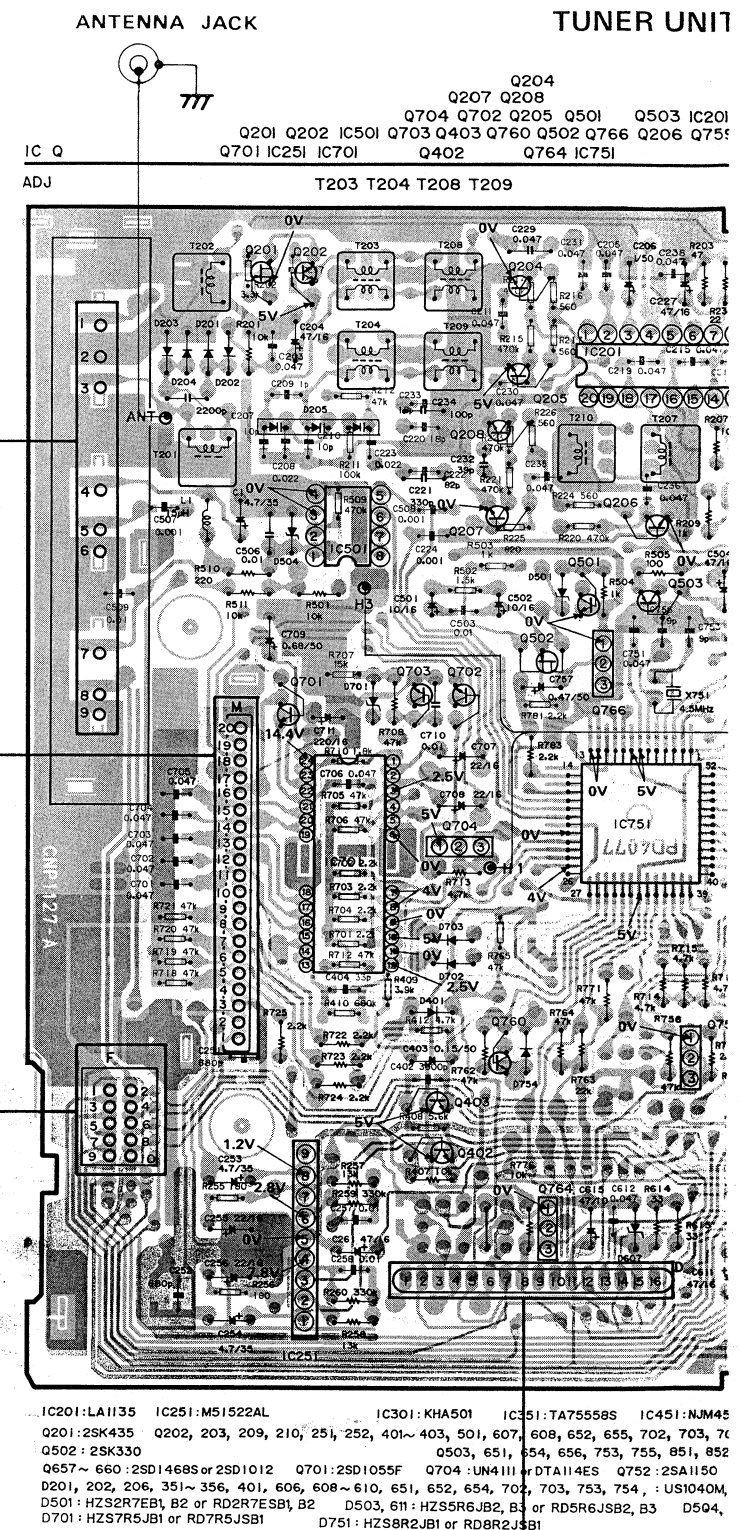
1	2	3	4	5	6	7	8	9	10
0V	0V	3.3V	3.3V	0V					
11	12	13	14	15	16	17	18	19	20
8.5V	8.2V	3.2V	0V	2.5V				0V	

FM UNIT IC51

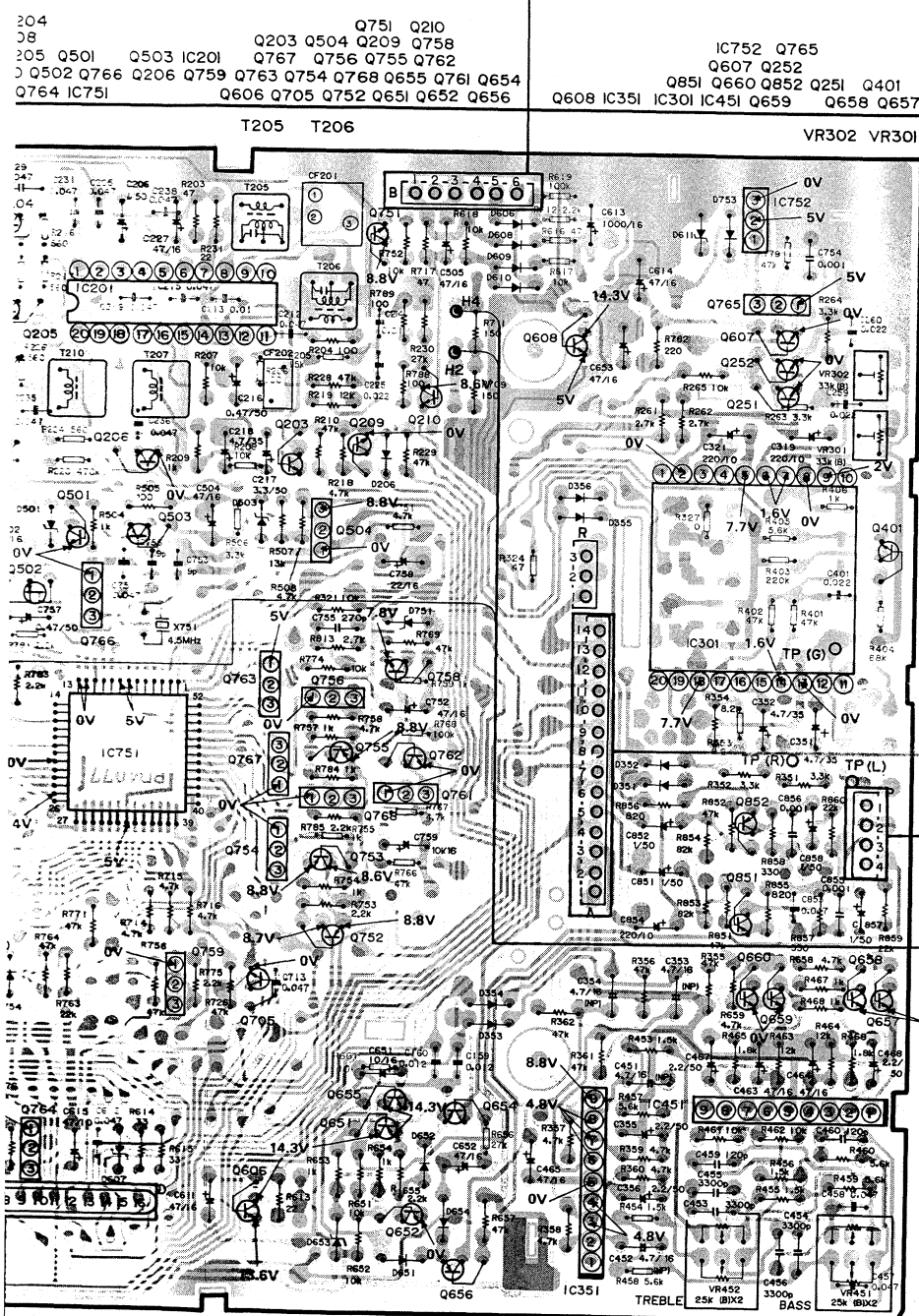
1	2	3	4	5	6	7	8
2.6V	2.6V	0V	2.1V	0.7V	5V	5V	
9	10	11	12	13	14	15	16
5V	0V	5V	5V	3.7V	0.6V	4V	

FM UNIT IC151

1	2	3	4	5	6	7
8.7V	1V	3V	5V	0V		
8	9	10	11	12	13	
0V	0V	2.4V	5V	3.7V	3.7V	

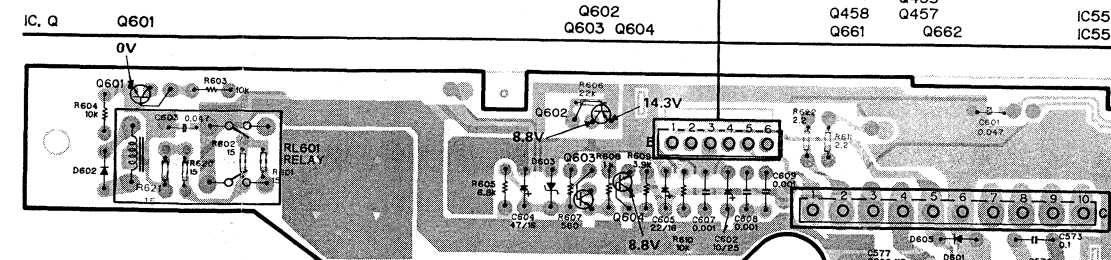


TUNER UNIT (CWE1030)



5: TA75558S IC451:NMJ4558S IC501:pB553AC IC701:PA3019 IC751:PD4077C IC752:MNI280-L
608, 652, 655, 702, 703, 705, 754, 758, 760, 762; 25C1740S or 25C2458 Q204~208, 606; 25C2458
54, 656, 753, 755, 851, 852: 2SA1048 Q504, 754, 756, 759, 764, 766~768; UN4212 or DTC124ES
ICDTA14ES Q752: 2SA1150 Q761, 763, 765: UN4113 or DTA144ES
7, 703, 753, 754; U5104M, 1SS176 or 1SS133 D203, 204: 1S1555
D205: KV1325Z3 or KV1325Z5
IC RD5REJ532, B3 D504, 607: RD5RE181, B2 or D23RE181, B2 D653: HZ58R2JB2, B3 or RD8R2JB2, B3

MAIN AMP UNIT (CWH1020)



IC551, 552 : TA7270P Q457~460, 601, 603~605 : 2SC2458 or 2SC536SP Q602 : 2SB941
Q 661, 662 : 2SD1468S or 2SD1012
D601, 605 : ERA15-02VH or SM-1A-02LFD D602, 604 : US1040M, 1SS133 or 1SS176 D603 : RD6R2ESB2 or HZ56R2EB2

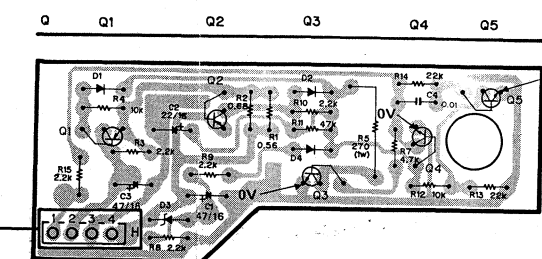
TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5.0V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

TUNER UNIT IC451

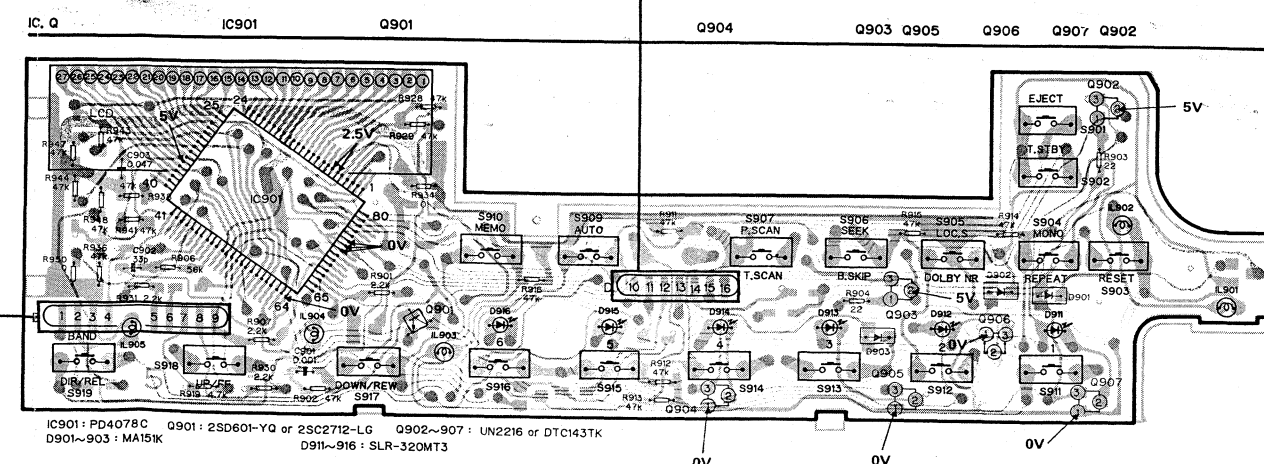
1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	—

PROTECTIVE CIRCUIT UNIT (CWM1191)

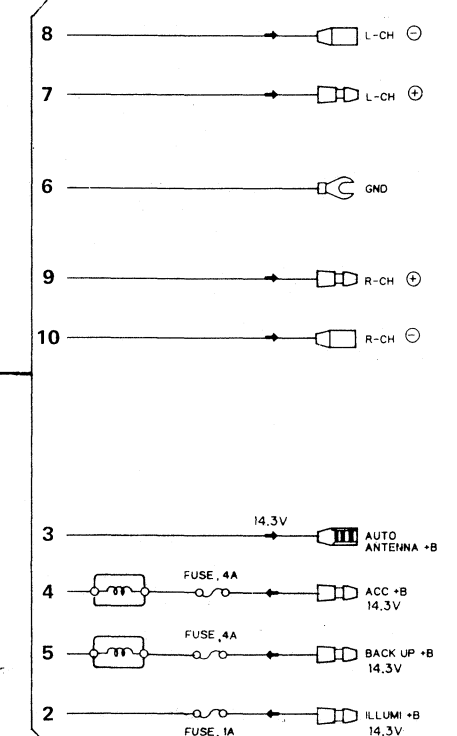


Q1: 2SB1066MF Q2: 2SA1048 or 2SA608SP Q3, 4: 2SC2021F
Q5: 2SC1740S or 2SC2458
D1, 2, 4: 5U1040M, 1SS133 or 1SS176 D3: RD22JSB2 or HZS22JB2

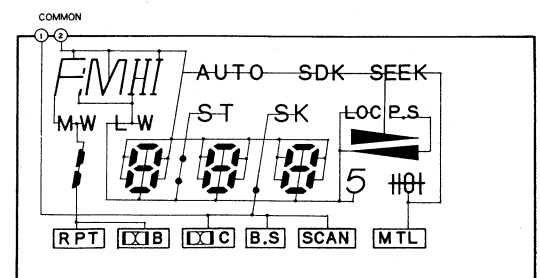
SWITCH UNIT (CWS1031)



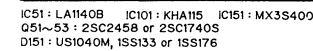
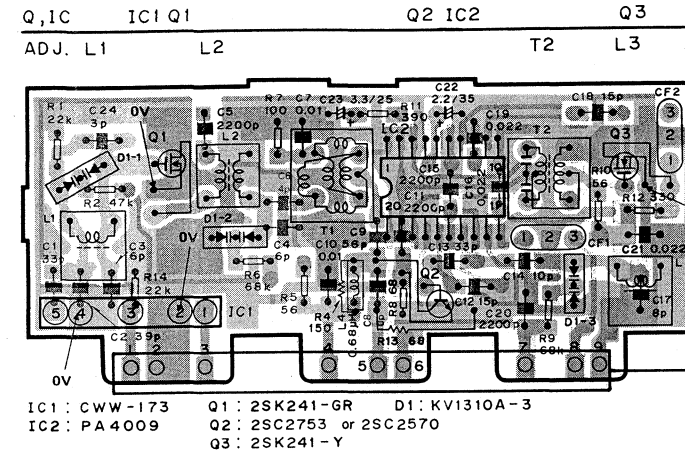
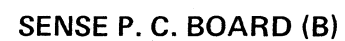
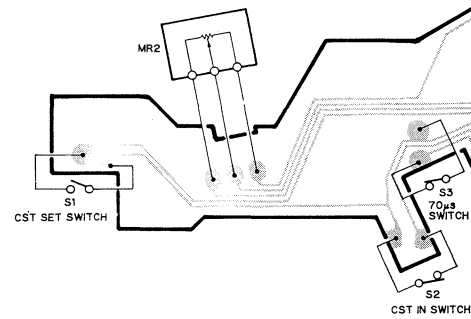
IC901: PD4078C Q901: 2SD601-YQ or 2SC2712-LG Q902~907: UN2216 or DTC143TK
D901~903: MA151K D911~916: SLR-320MT3



6	7
5V	0V
13	
3.7V	



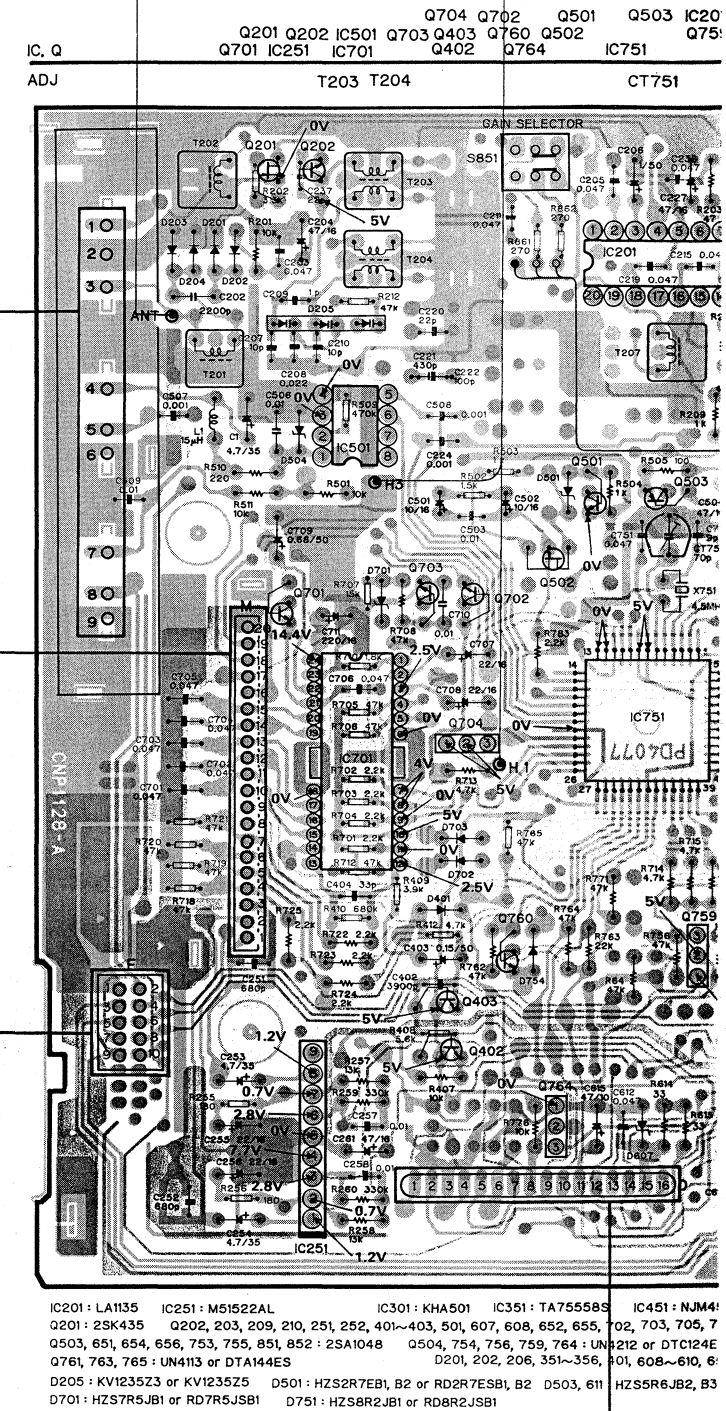
6

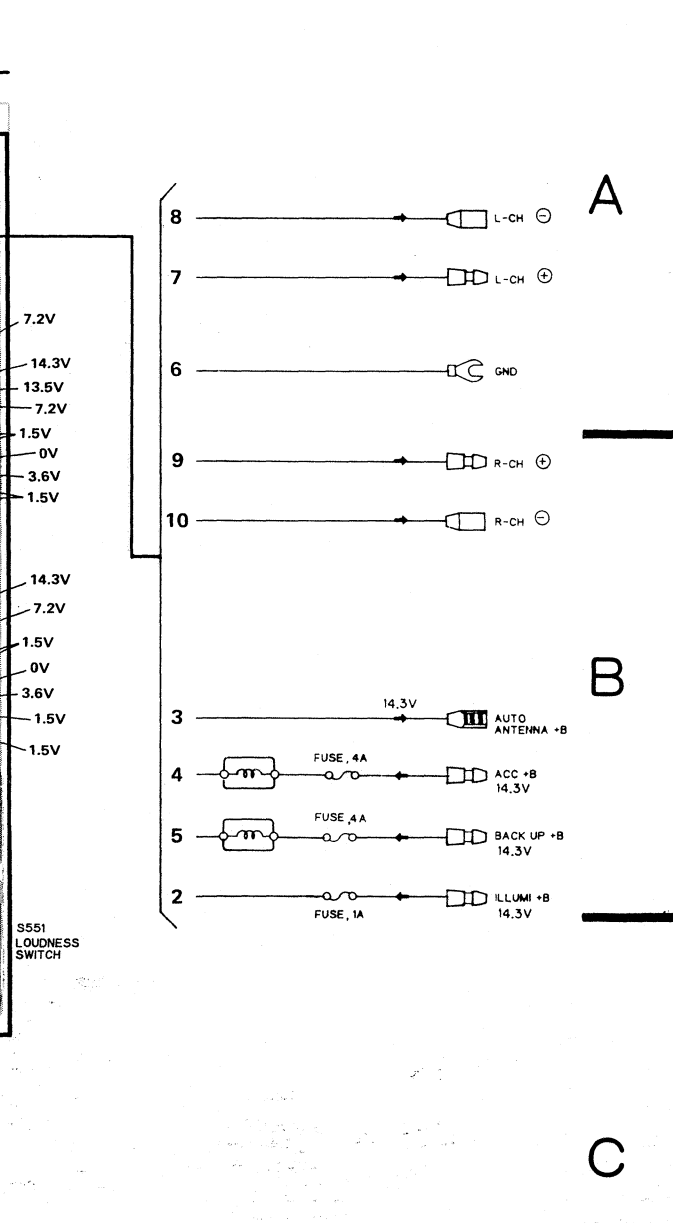
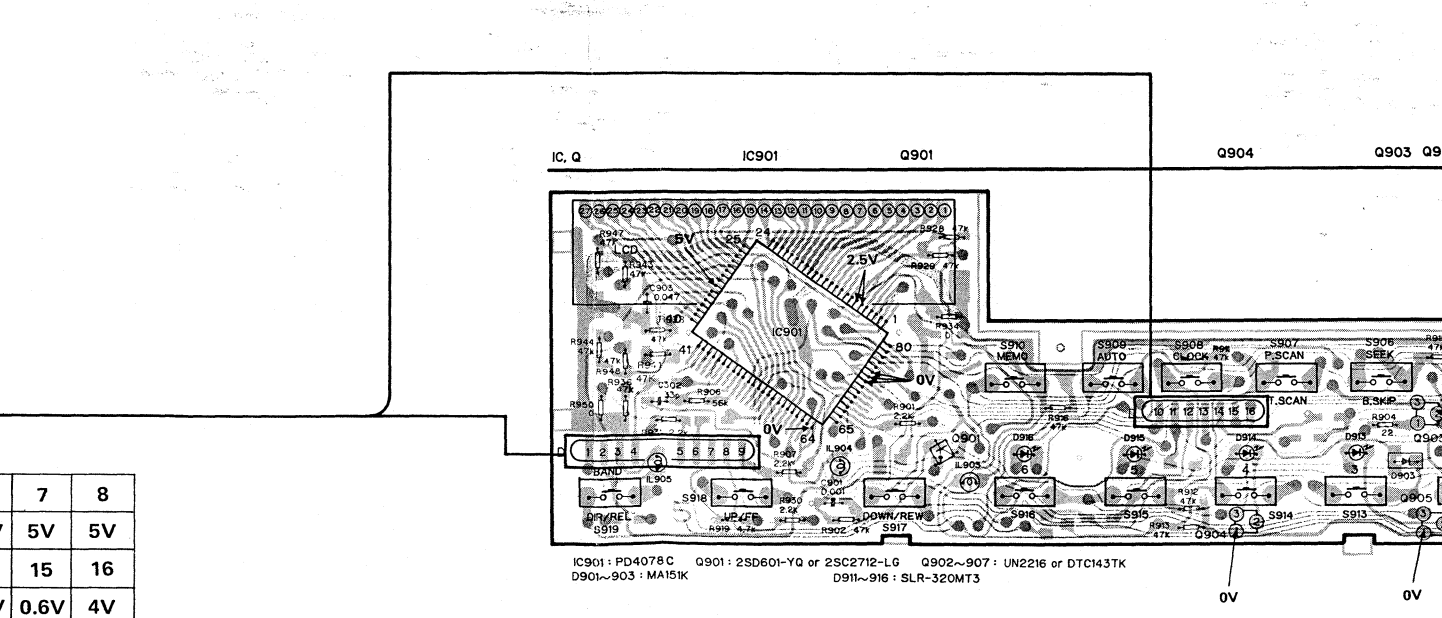
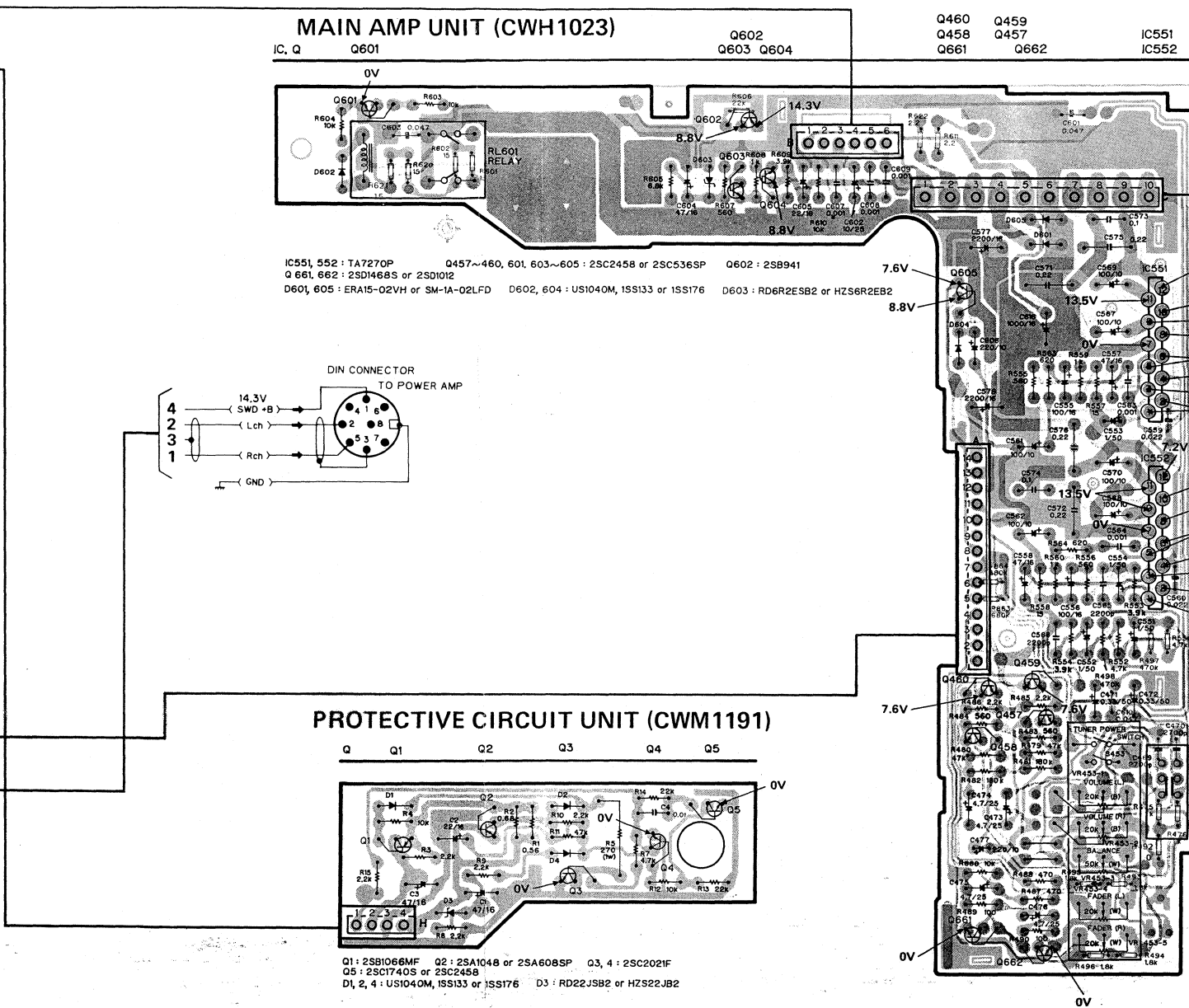
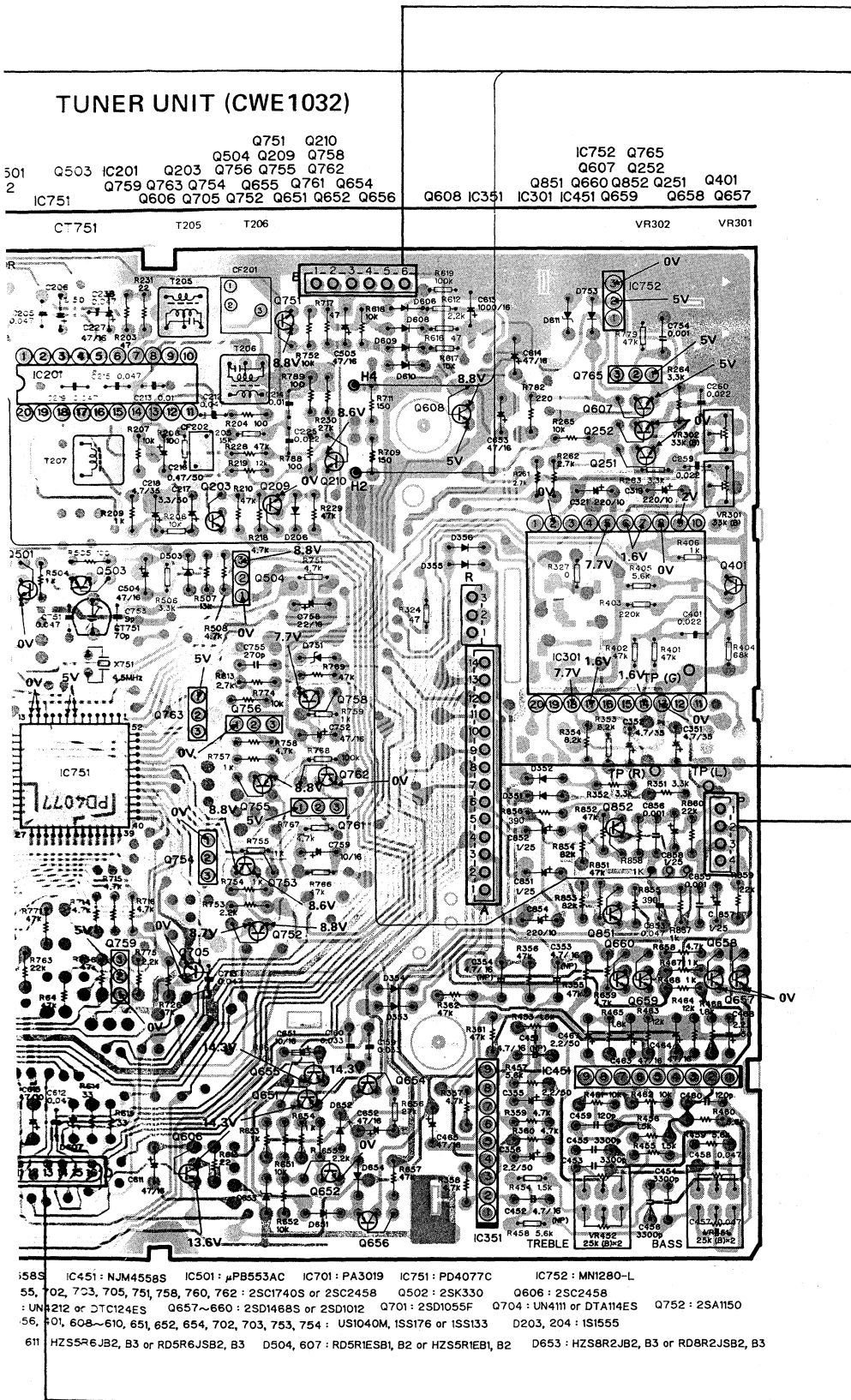


1	2	3	4	5	6	7	8	9	10
	0V				0V	3.3V	3.3V		0V
11	12	13	14	15	16	17	18	19	20
5.7V	8.5V	8.2V		0V				0V	

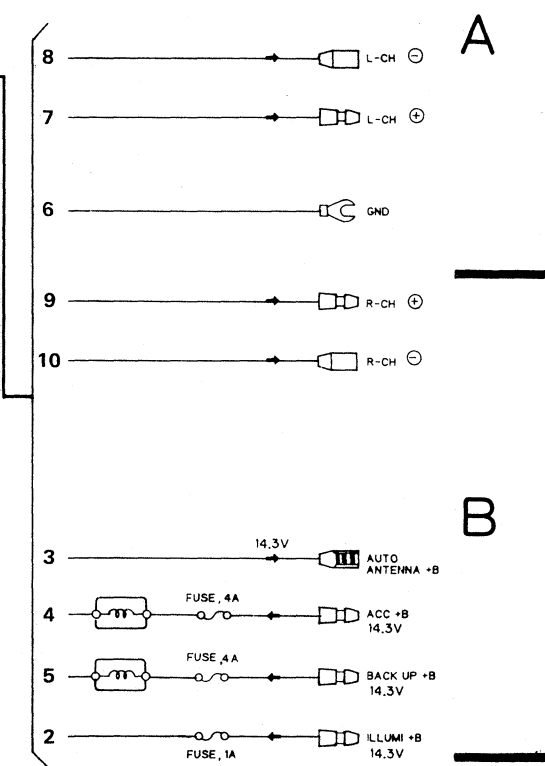
1	2	3	4	5	6	7	8	9	10
5V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	1.3V	2.3V	5.7V	5.7V	3V

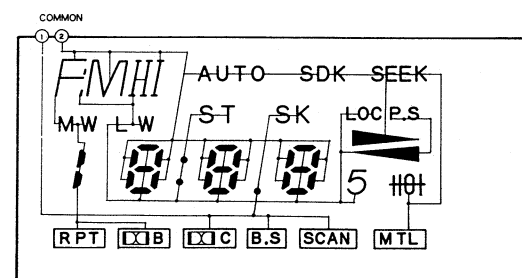
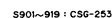
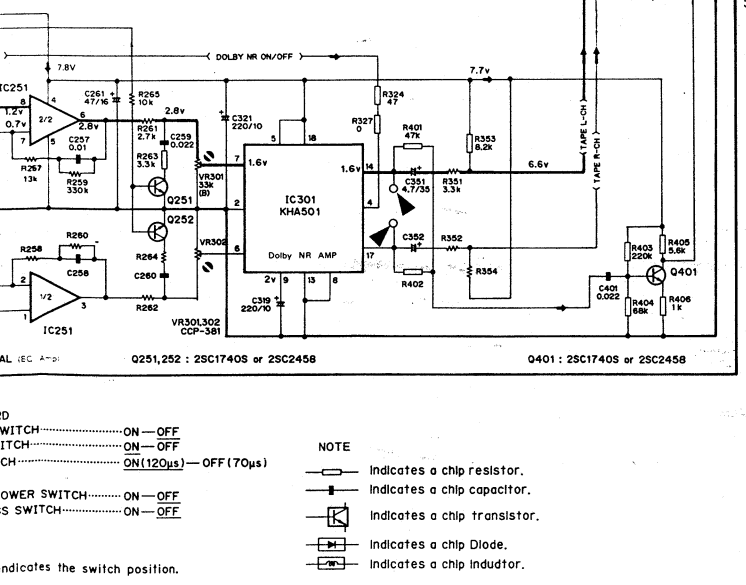
2 – 4	5	6 – 8	9
4.8V	0V	4.8V	8.8V





TUNER UNIT IC451		FM UNIT IC51							
1	2-4	5	6-8	1	2	3	4	5	6
8.8V	4.8V	0V	4.8V	2.6V	2.6V	2.6V	0V	2.1V	0.7V
				9	10	11	12	13	14
				5V	0V	5V	8.7V	5V	3.7V
								0.6V	4V





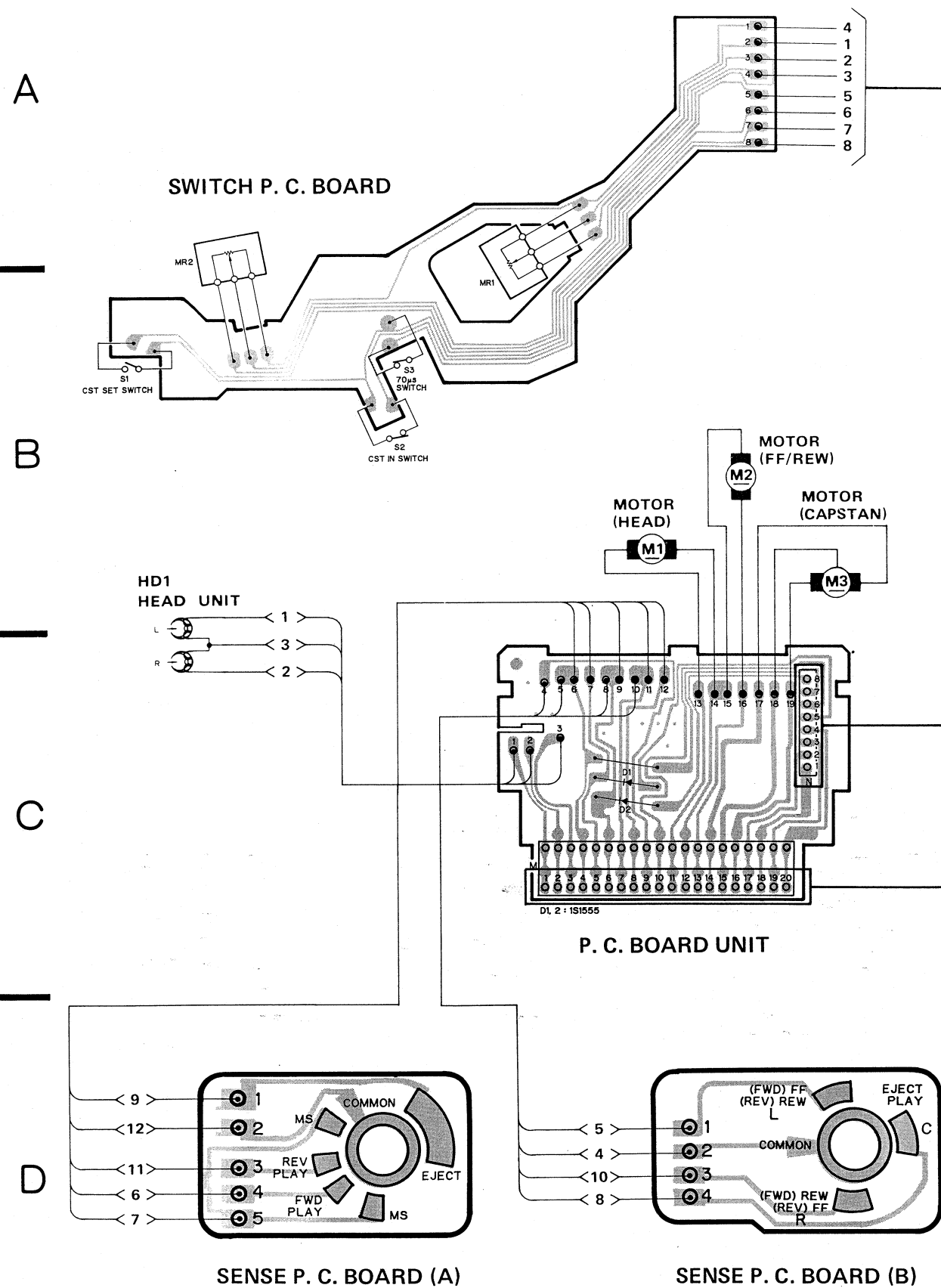
A

□

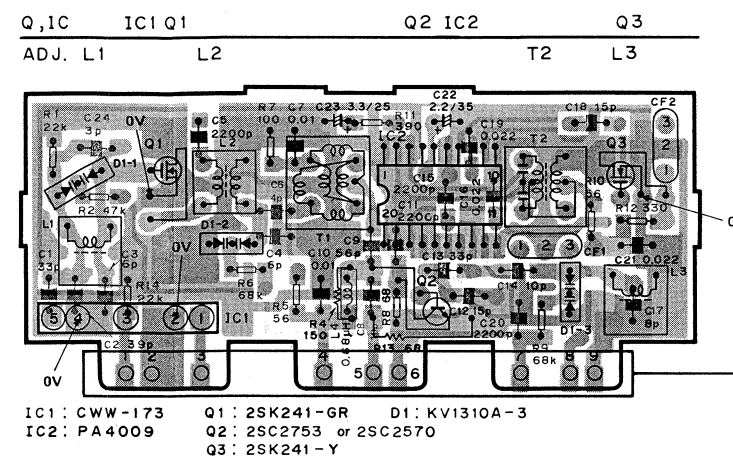
C

D

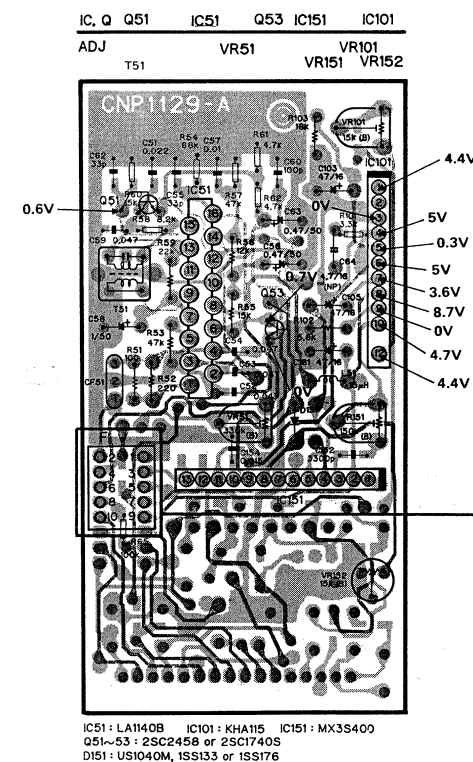
17. CONNECTION DIAGRAM (KEH-8020/ES)



FM FRONT END (CWB1004)



FM UNIT (CWE1020)

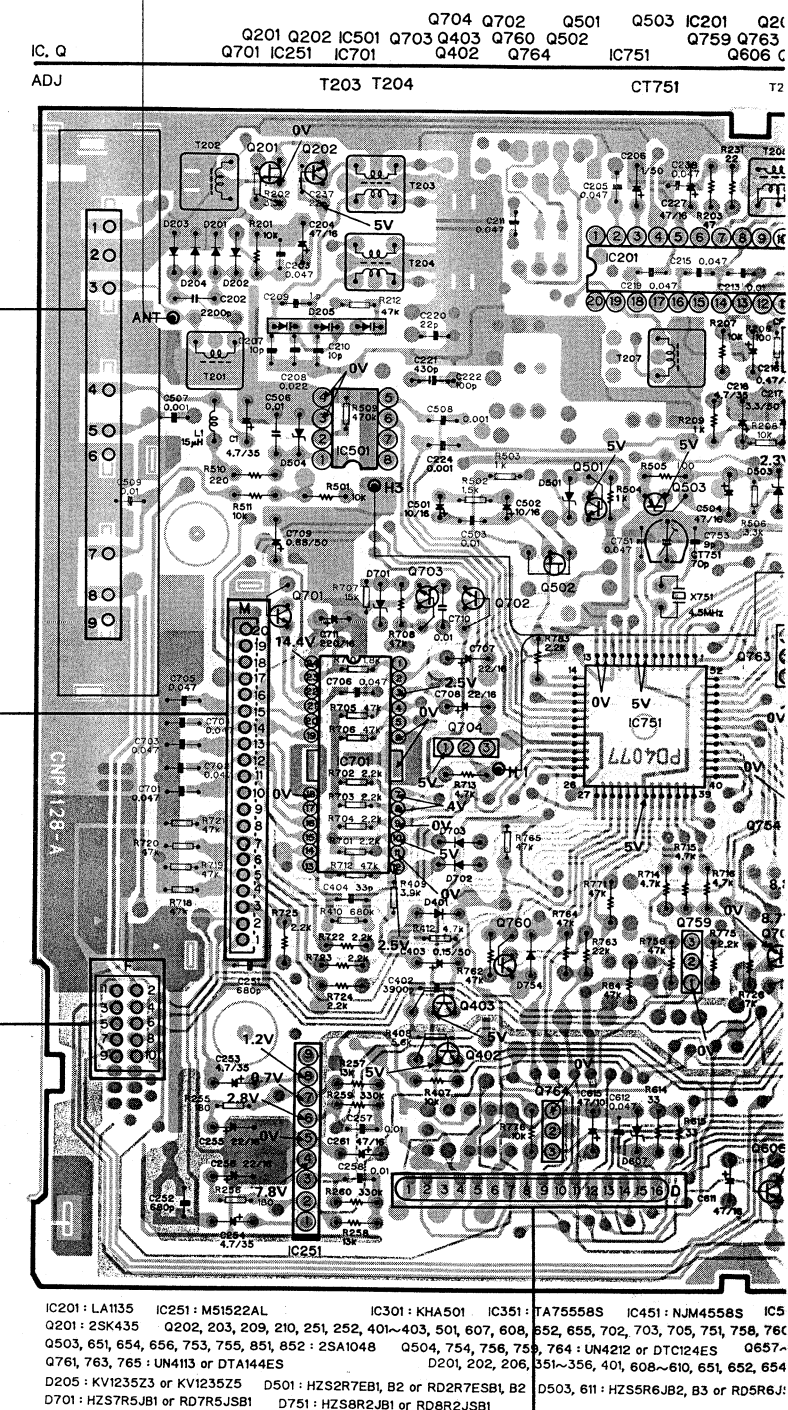


FM FRONT END IC2

1	2	3	4	5	6	7	8	9	10
0V				0V	3.3V	3.3V		0V	
11	12	13	14	15	16	17	18	19	20
8.5V	8.2V	3.2V	0V	2.5V				0V	

ANTENNA JACK

TUNER UNIT (CWE1031)



FM UNIT IC51

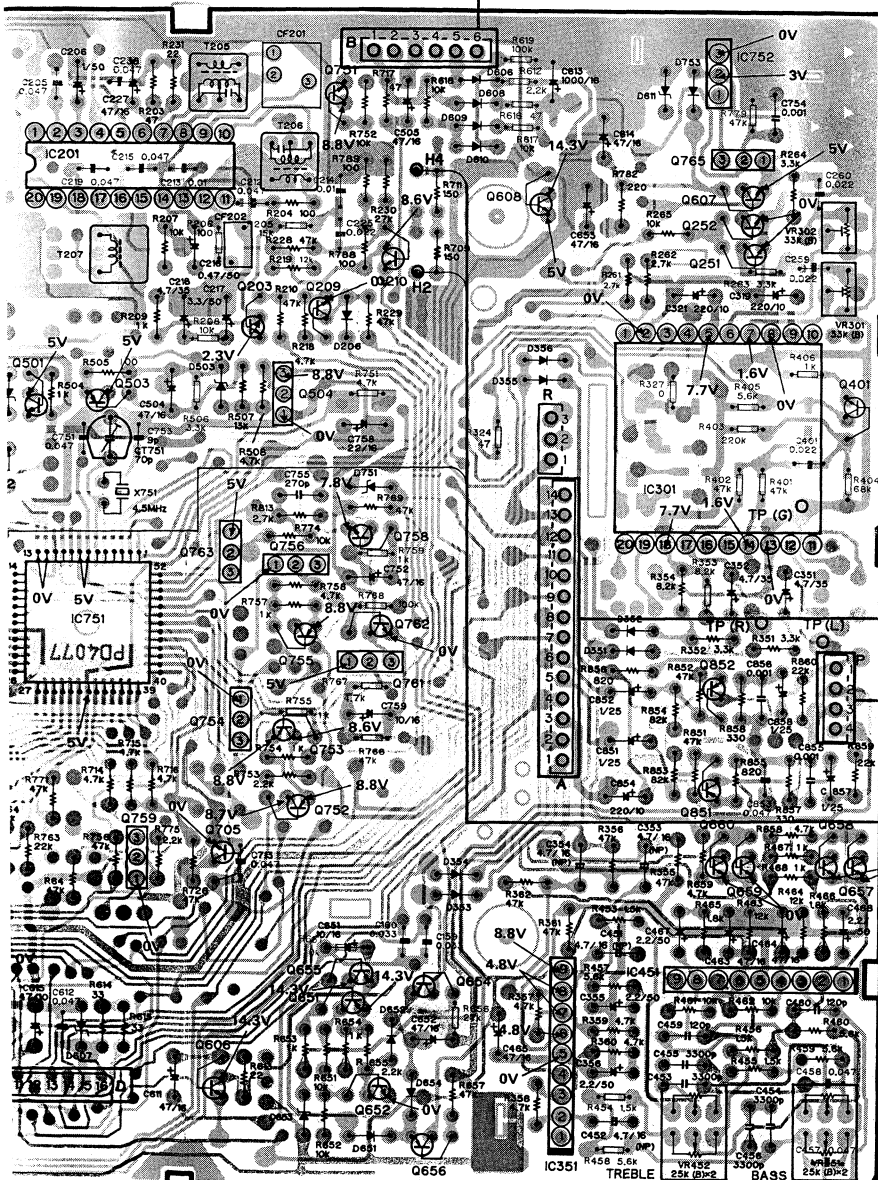
1	2	3	4	5	6	7	8
2.6V	2.6V		0V	2.1V	0.7V	5V	5V
9	10	11	12	13	14	15	16
5V	0V	5V		5V	3.7V	0.6V	4V

FM UNIT IC151

1	2	3
	8.7V	1V
8	9	10
0V	0V	2.4V

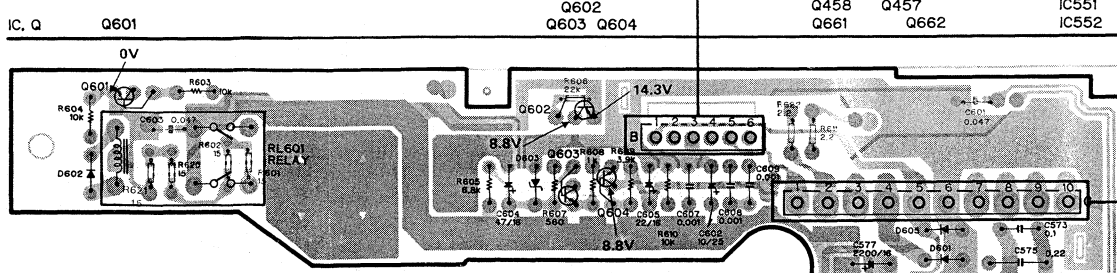
(CWE1031)

Q751 Q210
Q504 Q209 Q758
Q203 Q756 Q755 Q762
Q759 Q763 Q754 Q655 Q761 Q654
Q606 Q705 Q752 Q651 Q652 Q656
IC751 CT751 T205 T206
IC752 Q765
Q607 Q252
Q851 Q660 Q852 Q251 Q401
Q608 IC351 IC301 IC451 Q659 Q658 Q657
VR302 VR301



558S IC451: NJM4558S IC501: μPB553AC IC701: PA3019 IC751: PD4077C IC752: MN1280-L
355, 702, 703, 705, 751, 758, 760, 762: 2SC1740S or 2SC2458 Q502: 2SK330 Q606: 2SC2458
UN4212 or DT124ES Q657~660: 2SD1468S or 2SD1012 Q701: 2SD1055F Q704: UN4111 or DTA114ES Q752: 2SA1150
356, 401, 608~610, 651, 652, 654, 702, 703, 753, 754: US1040M, 1SS176 or 1SS133 D203, 204: 1S1555
611: HZS5R6JB2, B3 or RD5R6JSB2, B3 D504, 607: RD5RIE5B1, B2 or HZS5RIE5B1, B2 D653: HZS8R2JB2, B3 or RD8R2JSB2, B3

MAIN AMP UNIT (CWH1023)



IC551, 552: TA7270P Q457~460, 601, 603~605: 2SC2458 or 2SC536SP Q602: 2SB941
Q661, 662: 2SD1468S or 2SD1012
D601, 605: ERA15-02VH or SM-1A-02LFD D602, 604: US1040M, 1SS133 or 1SS176 D603: RD6R2ESB2 or HZS6R2EB2

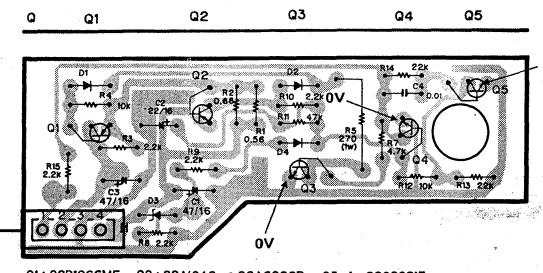
TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5.0V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

TUNER UNIT IC451

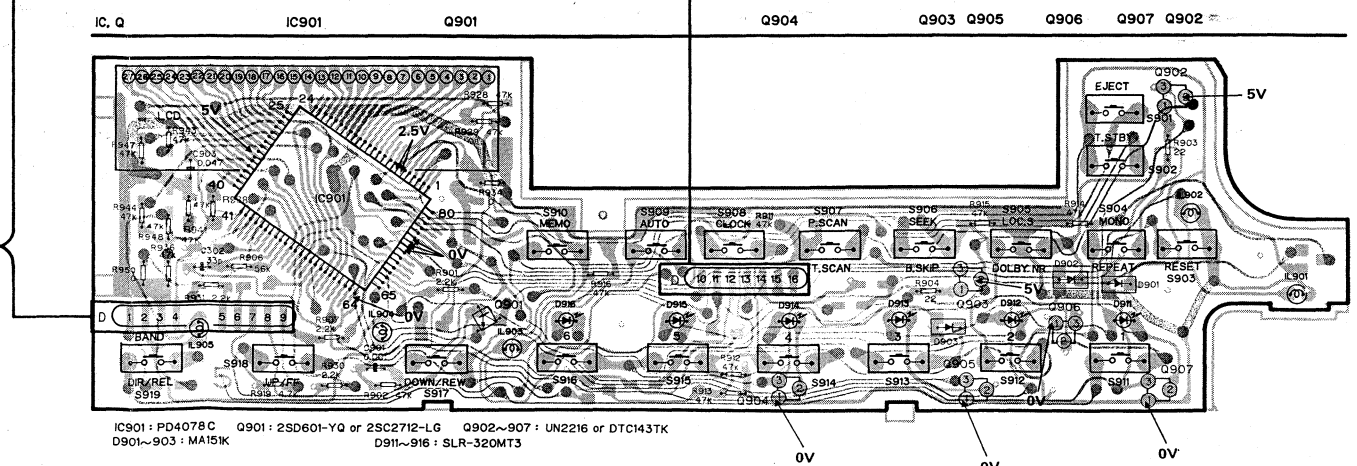
1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	

PROTECTIVE CIRCUIT UNIT (CWM1191)



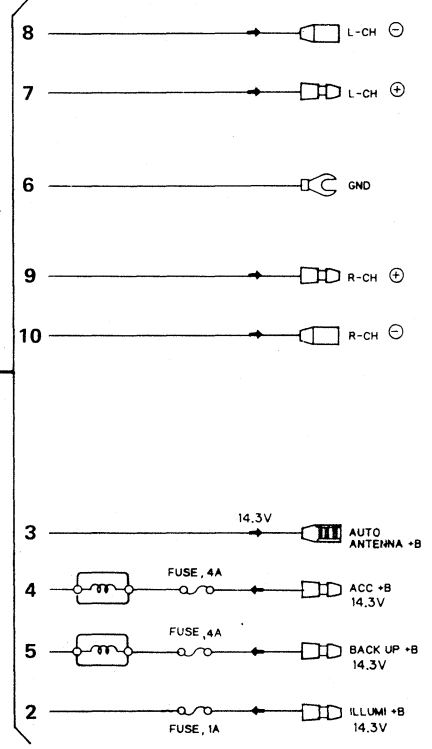
Q1: 2SB1066MF Q2: 2SA1048 or 2SA608SP Q3, 4: 2SC2021F
Q5: 2SC1740S or 2SC2458
D1, 2, 4: US1040M, 1SS133 or 1SS176 D3: RD22JSB2 or HZS22JB2

SWITCH UNIT (CWS1032)

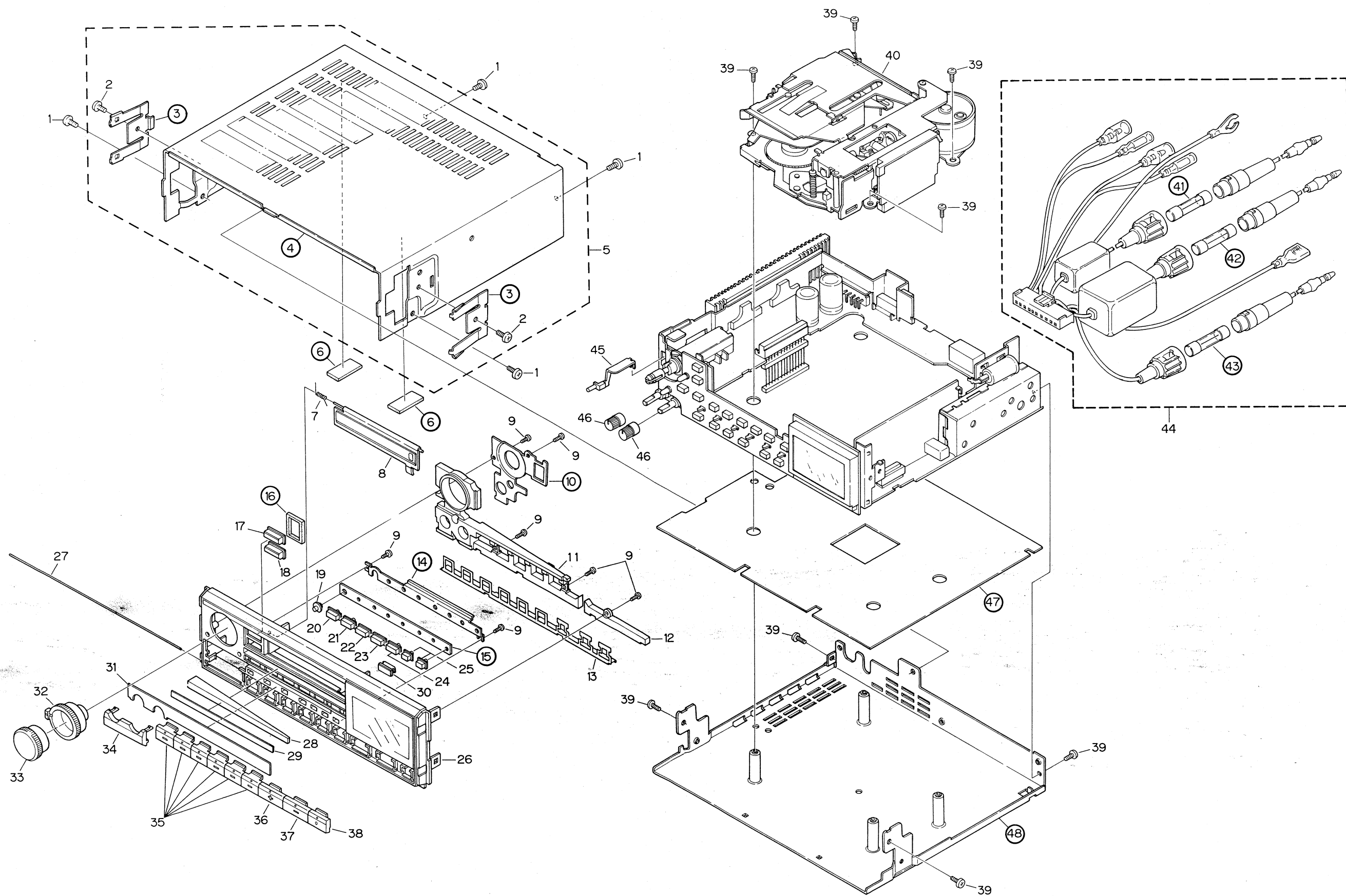


FM UNIT IC151

1	2	3	4	5	6	7
	8.7V	1V		3V	5V	0V
8	9	10	11	12	13	
0V	0V	2.4V	5V	3.7V	3.7V	



18. CABINET EXPLODED VIEW



● Part

NOTE:

● For
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 ★★: This
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 ● Parts
 ● Parts
 long

Mark

★
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 ★
 ★

Fig. 50

● Parts List

- NOTE:
- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
 - ★★: GENERALLY MOVES FASTER THAN ★.
 - This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
 - Parts whose parts numbers are omitted are subject to being not supplied.
 - Parts marked by “●” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	BMZ30P050FMC	Screw		28.	CNV1122	Lens
	2.	BMZ30P050FNI	Screw		29.	CNS1079	Plate (KEH-8030SDK/WG)
	3.		Spring			CNS1163	Plate (KEH-8020/US, CS, ES)
	4.		Case			CNS1182	Plate (KEH-8030/EW)
	5.	CXA1324	Case Unit	★	30.	CAC1217	Button (KEH-8030/EW)
	6.		Spacer	★	31.	CNS1080	Plate
	7.	CBH-682	Spring	★	32.	CAA1041	Knob (FADER)
	8.	CAT1036	Door (KEH-8030SDK/WG, 8030/EW, 8020/CS, ES)	★	33.	CAA1037	Knob (VOLUME, BALANCE, POWER SWITCH)
		CAT1038	Door (KEH-8020/US)	★	34.	CAC1214	Button
	9.	BPZ20P040FBK	Screw	★	35.	CAC1210	Button (PRESET)
	10.		Holder	★	36.	CAC1212	Button (DOWN/REW)
	11.	CNV1121	Lens	★	37.	CAC1213	Button (UP/FF)
	12.	CNV1118	Lens	★	38.	CAC1211	Button (BAND/DIR/REL)
	13.	CBL1021	Spring		39.	BMZ26P050FMC	Screw
	14.		Holder	●	40.	CXK1630	Cassette Mechanism Assy
	15.		Cushion		41.		Fuse, 4A
	16.		Cushion		42.		Fuse, 4A
★	17.	CAC1089	Button (EJECT)		43.		Fuse, 1A
★	18.	CAC1088	Button (TAPE STBY)		44.	CDE1278	Cord Assy (KEH-8030SDK/WG)
★	19.	CAC-998	Button (RESET)			CDE1279	Cord Assy (KEH-8030/EW, 8020/US, CS, ES)
★	20.	CAC1215	Button (MONO/REPEAT)		45.	CXA1339	Button Unit
★	21.	CAC1095	Button (LOC. S/DOLBY NR)	★	46.	CAA1036	Knob (BASS, TREBLE)
★	22.	CAC1094	Button (SEEK/BLANK SKIP)		47.		Insulator
★	23.	CAC1216	Button (PRESET SCAN/ TAPE SCAN)		48.		Chassis
★	24.	CAC1218	Button (SDK) (KEH-8030SDK/WG)				
		CAC1091	Button (CLOCK) (KEH-8020/US, CS, ES)				
★	25.	CAC1092	Button (AUTO MEMO, MEMO)				
	26.	CXA1320	Grille Unit (KEH-8020/US)				
		CXA1321	Grille Unit (KEH-8020/CS, ES)				
		CXA1322	Grille Unit (KEH-8030/EW)				
		CXA1323	Grille Unit (KEH-8030SDK/WG)				
	27.	CLA1103	Shaft				

19. CHASSIS EXPLODED VIEW

● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CNV1123	Housing		38.	VACANT	
	2.	CNV1124	Lens		39.		Holder
	3.		Spacer	★★	40.	KHA501	IC (IC301)
★	4.	CAW1002	LCD	★★	41.	CCS1020	Volume, 25kΩ (B) (BASS, TREBLE)
	5.		Holder		42.		Plug (14P)
	6.	BMZ26P050FMC	Screw		43.	CKS-269	Plug (4P)
	7.		Spacer		44.	VACANT	
	8.		Frame		45.		Connector (20P)
	9.		Spacer		46.		Plug (6P)
●	10.	CWS1030	Switch Unit (KEH-8030SDK/WG)		47.	CDF-704	Connector (3P) (KEH-8020/US, CS)
		CWS1031	Switch Unit (KEH-8030/EW)		48.		Holder
		CWS1032	Switch unit (KEH-8020/ES)		49.	CKX-006	Antenna Jack
		CWS1033	Switch Unit (KEH-8020/US, CS)	★★	50.	CSH1002	Switch (GAIN SELECTOR) (KEH-8020/US, CS)
	11.	CNP1082	P.C. Board		51.		Insulator (KEH-8030SDK/WG)
★★	12.	CEL1013	Lamp, 14V 40mA		52.		Holder (KEH-8030SDK/WG, 8030/EW)
	13.		Spacer		53.	CWB1004	FM Front End
★★	14.	CNW-855	Bush			CWB1006	(KEH-8030SDK/WG, 8030/EW, 8020/ES) FM Front End
★★	15.	CEL1010	Lamp, 14V 40mA		54.		(KEH-8020/US, CS) Shield plate (KEH-8030SDK/WG)
★★	16.	CSG-253	Switch		55.		Heat Sink
★★	17.	CSG-253	Switch (SDK/CLOCK) (KEH-8030SDK/WG, 8020/US, CS, ES)	●	56.	CWE1029	Tuner Unit (KEH-8030SDK/WG)
★	18.	SLR-320MT3	LED			CWE1030	Tuner Unit (KEH-8030/EW)
	19.	BMZ26P100FMC	Screw			CWE1031	Tuner Unit (KEH-8020/ES)
	20.		Heat Sink			CWE1032	Tuner Unit (KEH-8020/US, CS)
★★	21.	TA7270P	IC (IC551, 552)		57.	CNN-412	Cushion
	22.		Insulator		58.		Plug (10P) (KEH-8020/US, CS, ES, 8030/EW)
●	23.	CWH1019	Main Amp Unit (KEH-8030SDK/WG)		59.		Plug (16P) (KEH-8030SDK/WG)
		CWH1020	Main Amp Unit (KEH-8030/EW, 8020/ES)		60.		Connector (10P) (KEH-8020/US, CS, ES, 8030/EW)
		CWH1023	Main Amp Unit (KEH-8020/US, CS)		61.		Connector (16P) (KEH-8030SDK/WG)
	24.	BMZ26P060FMC	Screw	●	62.	CWE1019	FM Unit (KEH-8030SDK/WG)
★★	25.	2SB941	Transistor (Q602)			CWE1020	FM Unit (KEH-8030/EW, 8020/ES)
	26.		Holder			CWE1021	FM Unit (KEH-8020/US, CS)
	27.	CKS-467	Plug (10P)		63.		Holder
	28.		Connector (14P)	●	64.	CWM1191	Protective Circuit Unit
★★	29.	CSG-207	Switch (LOUDNESS)		65.		Connector (4P)
★★	30.	CCS1014	Volume, 20kΩ(B), 50kΩ(W), 20kΩ(W) (VOLUME, BALANCE, FADER, POWER)				
	31.	CBE1012	Spacer				
	32.		Holder				
	33.	NK100FMC	Nut				
	34.	HKS-195	Connector (6P)				
	35.	CSR-051	Relay (RL601)				
	36.	CNW-770	Cap				
	37.	CDE1308	DIN Donconnector				

- **Chassis**

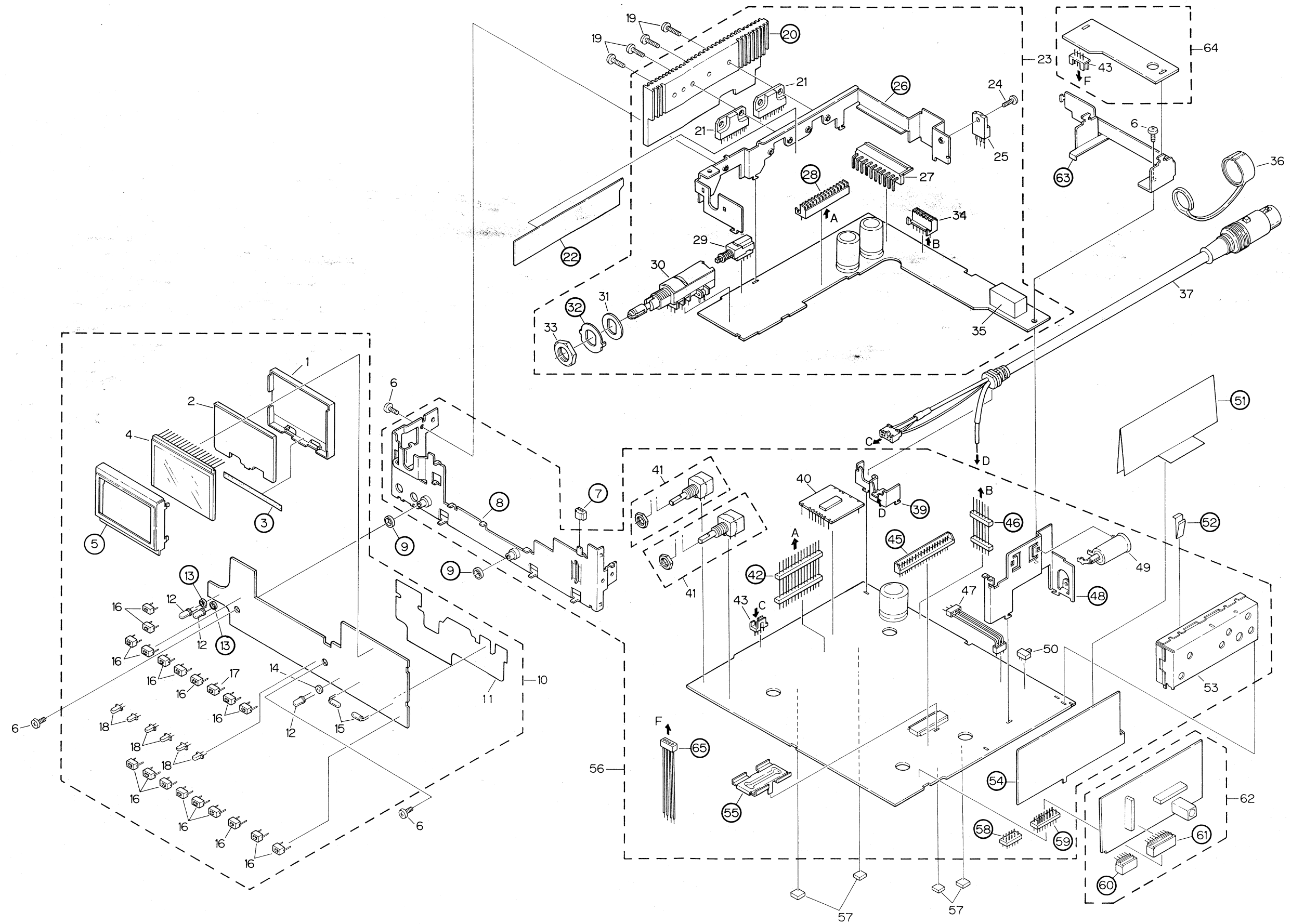


Fig. 51

20. CASSETTE MECHANISM ASSEMBLY EXPLODED VIEW

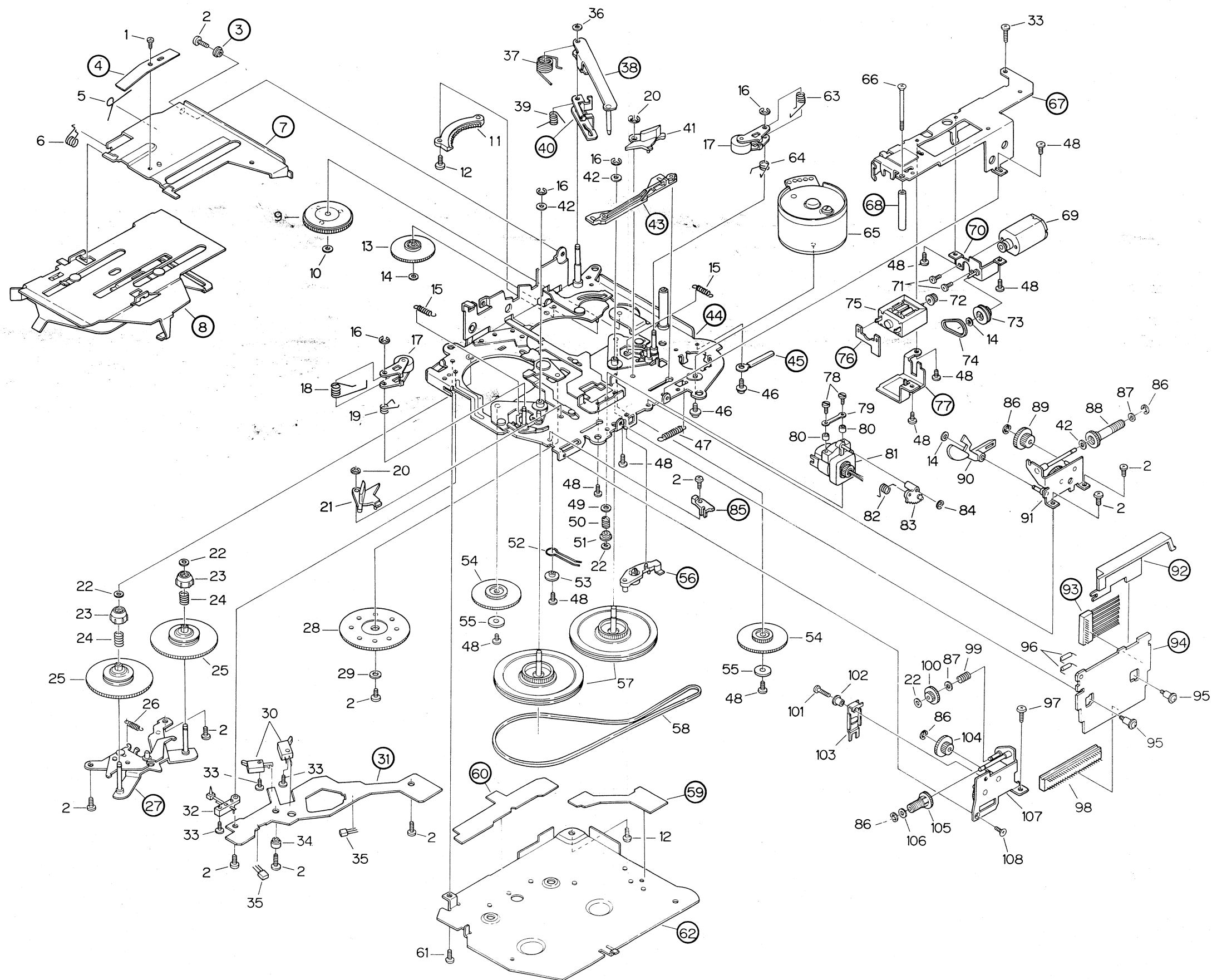


Fig. 52

● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	HBA-147	Screw, M1.4 x 1.4		56.		Clamper
	2.	BMZ20P040FMC	Screw		57.	CXA1015	Fly wheel
	3.		Bush	★★	58.	CNT-111	Belt
	4.		Spring		59.		Indulator
	5.	CBH-867	Spring		60.		Insulator
	6.	CBH-837	Spring		61.	BMZ20P030FMC	Screw
	7.		Arm		62.		Cover
	8.		Holder Unit		63.	CBH-831	Spring
	9.	CXD-900	Gear Unit		64.	CBH-833	Spring
	10.	HBF-119	Washer	★★	65.	CXM1007	Motor (Capston)
	11.	CNV1075	Gear		66.	CBA-165	Screw, M2 x 25
	12.	CBA1004	Screw		67.		Guide
	13.	CNY-271	Gear		68.		Spacer
	14.	CBF-126	Washer	★★	69.	CXM-452	Motor (Head Position)
	15.	CBH-835	Spring		70.		Bracket Unit
	16.	CBG1001	E type washer		71.	HBA-244	Screw
	17.	CXD-387	Pinch Roller Unit		72.	CNW-941	Gear
	18.	CBH-832	Spring		73.	CNY-075	Pulley
	19.	CBH-834	Spring	★★	74.	CNT-114	Belt
	20.	YE25FUC	E type washer	★★	75.	CXM-351	Motor (Gear Position)
	21.	CNW-930	Arm		76.		P.C. Board
	22.	CBF-135	Washer		77.		Bracket
	23.	CNW-932	Collar		78.	CBA-173	Screw, M1.4 x 8
	24.	CBH-827	Spring		79.	CBE-114	Spring
★★	25.	CXD-877	Reel Unit		80.	CNY-134	Azimuth Rubber
	26.	CBH-868	Spring	★★	81.	CXA1123	Head Unit
	27.		Bracket Unit		82.	CBH-829	Spring
	28.	CNW-944	F/R Gear		83.	CNW-939	Gear
	29.	CLA1109	Collar		84.	YE15FUC	E type washer
★★	30.	CSN-091	Switch (70μ, CST IN)		85.		Spacer
	31.		P.C. Board		86.	YE12FUC	E type washer
★★	32.	CSN-089	Switch (CST SET)		87.	HBF-116	Washer
	33.	CBA-172	Screw		88.	CNW-956	Gear
	34.	CLA1087	Collar		89.	CNW-955	Gear
	35.	SDME106A	Magnetic Resistive Device		90.	CNV1260	Arm
	36.	CBF-046	Washer		91.	CXA1432	Holder Assy
	37.	CBH-887	Spring		92.		Holder
	38.		Arm Unit		93.		Connector (8P)
	39.	CBH-886	Spring		94.		P.C. Board
	40.		Arm		95.	CBA1022	Screw
	41.	CNW-931	Arm	★	96.	1S1555	Diode
	42.	HBF-179	Washer		97.	BMZ20P060FMC	Screw
	43.		Lever		98.	CKS-678	Connector (40P)
	44.		Chassis Unit		99.	CBH-866	Spring
	45.		Clamper		100.	CNW-954	Gear
	46.	PMS26P030FMC	Screw		101.	HBA-158	Screw
	47.	CBH-830	Spring		102.	CLB-750	Collar
	48.	HBA-175	Screw		103.	CNH-004	Arm
	49.	CBE-123	Washer		104.	CNY-077	Gear
	50.	CBH-902	Spring		105.	CNY-148	Gear
	51.	HNC-953	Holder		106.	CBF-088	Washer
	52.	CBH-893	Spring		107.	CXA1433	Holder Assy
	53.	CLA1110	Collar		108.	HBA-209	Screw
	54.	CNV1178	Gear				
	55.	CLA1108	Collar				

21. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 × 10 ¹	561.....	RD1/4PS 5 6 1 J
47kΩ	47 × 10 ³	473.....	RD1/4PS 4 7 3 J
0.5Ω	0R5.....		RN2H 0 5 K
1Ω	010.....		RS1P 0 1 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10¹..... RN1/4SR 5 6 2 1 F

- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.

★★: GENERALLY MOVES FASTER THAN ★.

This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/8S □□□J

Chip Capacitor (except for CQS.....)

CKS....., CCS.....

FM Front End

FM Front End	Model
CWB1004	KEH-8030SDK/WG, EW KEH-8020/ES
CWB1006	KEH-8020/US, CS

RESISTORS

Mark	Symbol & Description	Part No.
	R1, 2, 5 - 12, 14 R13	RS1/8S □□□J RD1/6PS □□□J or RD1/4PS □□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CCSSH330J50
	C2	CCSSH390J50
	C3	CCSCH060D50 or CCSCH060C50
	C4	CCSTH060C50 or CCSTH060D50
	C5, 11, 15, 20	CKSYB222K50
	C6	CCSCH040C50
	C7, 10	CKSYB103K50
	C8	CCSCH100D50
	C9	CCSSH560J50
	C12, 18	CCSTH150J50
	C13	CCSTH330J50
	C14	CCSTH100D50
	C16, 19, 21	CKSYB223K50
	C17	CCSUJ080D50
	C22	CEA2R2M35LS
	C23	CEA3R3M25LS
	C24	CCSSH030C50

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	CWW-173 or CWW1015
★★	IC2	PA4009
★★	Q1, 3	2SK241
★★	Q2	2SC2753 or 2SC2570
★	D1	*KV1310A-3
	L1 Coil	CTC1001
	L2 Coil	CTC1002
	L3 Coil	CTC1003
	L4 Chip Inductor	CTF-185
	T1 Coil	CTC1005
	T2 Coil	CTC1004
	CF1, 2 Cermic Filter (CWB1004)	CTF-182
	CF1, 2 Ceramic Filter (CWB1006)	CTF-101

*KV1310A-3 consists of 3 parts. Separate it into 3 parts before installation. (Be sure to replace 3 parts at a time.)

Tuner Unit

Tuner Unit	Model
CWE1029	KEH-8030SDK/WG
CWE1030	KEH-8030/EW

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC201	LA1135
★★	IC251	M51522AL
★★	IC301	KHA501
★★	IC351	TA75558S
★★	IC451	NJM4558S
★★	IC501	μPB553AC
★★	IC701	PA3019
★★	IC751	PD4077C
★★	IC752	MN1280-L
★★	Q201	2SK435
★★	Q202, 203, 209, 210, 251, 252, 401 – 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762	2SC1740S or 2SC2458
★★	Q204 – 208, 606	2SC2458
★★	Q502	2SK330
★★	Q503, 651, 654, 656, 753, 755, 851, 852	2SA1048
★★	Q504, 754, 756, 759, 764, 766 – 768	UN4212 or DTC124ES
★★	Q657 – 660	2SD1468S or 2SD1012
★★	Q701	2SD1055F
★★	Q704	UN4111 or DTA114ES
★★	Q752	2SA1150
★★	Q761, 763, 765	UN4113 or DTA144ES
★★	Q802, 805 (KEH-8030SDK/WG)	2SC1740S or 2SC2458
★★	Q803, 804 (KEH-8030SDK/WG)	UN4212 or DTC124ES
★	D201, 202, 206, 351 – 356, 401, 606, 608 – 610, 651, 652, 654, 702, 703, 753, 754, 801, 802	US1040M or 1S5133 or 1S5176
★	D203, 204	1S1555
★	D205	KV1235Z3 or KV1235Z5
★	D501	HZS2R7EB1 or HZS2R7EB2 or RD2R7ESB1 or RD2R7ESB2
★	D503, 611	HZS5R6JB2 or HZS5R6JB3 or RD5R6JSB2 or RD5R6JSB3

Mark	Symbol & Description	Part No.
★	D504, 607	RD5R1ESB1 or RD5R1ESB2 or HZS5R1EB1 or HZS5R1EB2
★	D653	HZS8R2JB2 or HZS8R2JB3 or RD8R2JSB2 or RD8R2JSB3
★	D701	HZS7R5JB1 or RD7R5JSB1
★	D751	HZS8R2JB1 or RD8R2JSB1
	L1 Ferri-Inductor, 15μH	CTF1013
	T201 Coil	CTB-149
	T202 Coil	CTB-167
	T203, 204 Coil	CTB-172
	T205 Coil	CTE-159
	T206 Coil	CTE-160
	T207 Coil	CTB1001
	T208, 209 Coil	CTB-175
	T210 Coil	CTB-165
	CF201 Filter	CTF-100 or
	CF202 Ceramic Filter	CTF-240
	X751 X'tal, 4.5MHz	CTF-247
★★	VR301, 302 Semi-fixed, 33kΩ (B)	CSS-046
★★	VR451, 452 Volume, 25kΩ (B) (TREBLE, BASS)	CCP-381
★★	VR451, 452 Volume, 25kΩ (B) (TREBLE, BASS)	CCS1020

RESISTORS

Mark	Symbol & Description	Part No.
	R201, 203, 204, 207, 209, 210, 218, 219, 228 – 231, 257 – 262, 264, 265, 351, 352, 354 – 362, 407, 453, 455 – 457, 459 – 468, 501, 504, 505, 507, 508, 510, 511, 561, 613 – 615, 618, 652 – 655, 657 – 660, 708, 709, 711, 713 – 717, 722 – 726, 752 – 754, 756 – 758, 762 – 764, 769, 771, 774 – 776, 782 – 785, 787 – 789, 813, 851 – 860	RD1/4PS□□□JL
	R202, 205, 206, 208, 211, 212, 214 – 217, 220, 221, 223 – 226, 255, 256, 263, 324, 327, 353, 401 – 406, 408 – 410, 412, 454, 458, 502, 503, 506, 509, 612, 616, 617, 619, 656, 661, 701 – 707, 710, 712, 718 – 721, 751, 755, 759, 765 – 768, 779, 781	RS1/8S□□□J
	R786, 809 (KEH-8030SDK/WG)	RS1/8S□□□J
	R814 – 816, 818, 820 (KEH-8030SDK/WG)	RD1/4PS □□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 218	CEA4R7M35LS
	C159, 160	CKSYB123K50
	C202	CKPYX222M16L
	C203, 205, 211, 212, 215, 230, 231, 235	CKSYF473Z50
	C204, 227, 463, 464, 505	CEA470M16L2
	C206, 851, 852, 857, 858	CEA010M50L2
	C207, 210	CCSSH100D50
	C208, 223, 225, 259, 260, 401	CKSYB223K25
	C209	CCSCH010C50
	C213, 214, 257, 258, 503, 509	CKSYB103K50
	C216	CEAR47M50LS2
	C217	CEA3R3M50LS
	C219, 238	CKSYB473K25
	C220	CCSUJ180J50
	C221	CQPA331G100
	C222	CCSRH820J50
	C224, 507, 508	CKSYB102K50
	C229	CKDBC473K25
	C232	CCDSH390J50L
	C233	CCSCH180J50
	C234	CCDRH101G50L
	C236, 457, 458, 612, 701 – 706	CKSYF473Z50
	C237	CCSSL220J50
	C251, 252	CKSYB681K50
	C253, 254	CEANL4R7M35LL
	C255, 256	CEA220M16L2
	C261, 465, 504, 611, 752	CEA470M16LS
	C319, 321, 854	CEA221M10L2
	C351, 352	CEA4R7M35L2
	C353, 354, 451, 452	CEA4R7M16NPLL
	C355, 356	CEA2R2M50L2
	C402	CKSYB392K50
	C403	CEAR15M50LS2
	C404	CCSCH330J50
	C453 – 456	CKPYX332M16L
	C459, 460	CKPYB121K50L
	C467, 468	CEA2R2M50L2
	C501, 502	CSYA100M160S
	C506, 710	CKPYY103M16L
	C613 1000μF/16V	CCH1003
	C614, 653	CEA470M16L2
	C615, 652	CEA470M16LS
	C651, 759	CEA100M16LS
	C707, 708, 758	CEA220M16LS
	C709	CEAR68M50LS2
	C711	CEA221M16L2
	C713, 751, 853	CKSYF473Z50
	C753, 756	CCSCH090D50
	C754, 855, 856	CKPYB102K50L
	C755	CKPYB271K50L
	C757	CEAR47M50LS2
	C810 (KEH-8030SDK/WG)	CEA470M16LS
	C811 (KEH-8030SDK/WG)	CKSYF473Z50

Tuner Unit

Tuner Unit	Model
CWE1031	KEH-8020/ES
CWE1032	KEH-8020/US, CS

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC201	LA1135
★★	IC251	M51522AL
★★	IC301	KHA501
★★	IC351	TA75558S
★★	IC451	NJM4558S
★★	IC501	μPB553AC
★★	IC701	PA3019
★★	IC751	PD4077C
★★	IC752	MN1280-L
★★	Q201	2SK435
★★	Q202, 203, 209, 210, 251, 252, 401 – 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762	2SC1740S or 2SC2458
★★	Q502	2SK330
★★	Q503, 651, 654, 656, 753, 755, 851, 852	2SA1048
★★	Q504, 754, 756, 759, 764	UN4212 or DTC124ES
★★	Q606	2SC2458
★★	Q657 – 660	2SD1468S or 2SD1012
★★	Q701	2SD1055F
★★	Q704	UN4111 or DTA114ES
★★	Q752	2SA1150
★★	Q761, 763, 765	UN4113 or DTA144ES
★	D201, 202, 206, 351 – 356, 401, 608 – 610, 651, 652, 654, 702, 703, 753, 754	US1040M or 1SS133 or 1SS176
★	D203, 204	1S1555
★	D205	KV1235Z3 or KV1235Z5
★	D501	HZS2R7EB1 or HZS2R7EB2 or RD2R7ESB1 or RD2R7ESB2
★	D503, 611	HZS5R6JB2 or HZS5R6JB3 or RD5R6JSB2 or RD5R6JSB3
★	D504, 607	RD5R1ESB1 or HZS5R1EB1 or HZS5R1EB2

Mark	Symbol & Description	Part No.
★ D653		HZS8R2JB2 or HZS8R2JB3 or RD8R2JSB2 or RD8R2JSB3
★ D701		HZS7R5JB1 or RD7R5JSB1
★ D751		HZS8R2JB1 or RD8R2JSB1
L1	Ferri-Inductor, 15μH	CTF1013
T201	Coil	CTB-149
T202	Coil	CTB-167
T203, 204	Coil	CTB-172
T205	Coil	CTE-159
T206	Coil	CTE-160
T207	Coil	CTB1001
CF201	Filter	CTF-100 or CTF-240
CF202	Ceramic Filter	CTF-247
CT751	Trimmer, 70pF	CCG-070
X751	X'tal, 4.5MHz	CSS-046
★★ VR301, 302	Semi-fixed, 33kΩ (B)	CCP-381
★★ VR451, 452	Volume, 25kΩ (B) (TREBLE, BASS)	CCS1020
★★ S851	Switch (GAIN SELECTOR) (KEH-8020/US, CS)	CSH1002

RESISTORS

Mark	Symbol & Description	Part No.
R64	(KEH-8020/US, CS)	RD1/4PS□□□JL
R201, 203, 204, 207, 209, 210, 218, 219, 228 – 231, 257 – 262, 264, 265, 351, 352, 354 – 362, 407, 453, 455 – 457, 459 – 468, 501, 504, 505, 507, 508, 510, 511, 561, 613 – 615, 618, 652 – 655, 657 – 660, 708, 709, 711 713 – 717, 722 – 726, 752 – 754, 756 – 758, 762 – 764, 769, 771, 774 – 776, 782, 783, 788, 789, 813, 851 – 860		RD1/4PS□□□JL
R202, 205, 206, 208, 212, 255, 256, 263, 324, 327, 353, 401 – 406, 408 – 410, 412, 454, 458, 502, 503, 506, 509, 616, 617, 619, 656, 661, 701 – 707, 710, 712, 718 – 721, 751, 755, 759, 765 – 768, 779		RS1/8S□□□J
R861, 862 (KEH-8020/US, CS)		RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
C1, 128		CEA4R7M35LS
C159, 160 (KEH-8020/ES)		CKSYB123K50
C159, 160 (KEH-8020/US, CS)		CKSYB333K25
C202		CKPYX222M16L
C203, 205, 211, 212, 215		CKSYF473Z50
C204, 227, 463, 464, 505		CEA470M16L2
C206, 851, 852, 857, 858		CEA010M50L2
C207, 210		CCSSH100D50
C208, 225, 259, 260, 401		CKSYB223K25
C209		CCSCH010C50
C213, 214, 257, 258, 503, 509		CKSYB103K50
C216		CEAR47M50LS2
C217		CEA3R3M50LS
C219, 238		CKSYB473K25
C220		CCSUJ220J50
C221		CQPA431G100
C222		CCSRH101J50
C224, 507, 508		CKSYB102K50
C229		CKDYBC473K25
C237		CCSSL220J50
C251, 252		CKSYB681K50
C253, 254		CEANL4R7M35LL
C255, 256		CEA220M16L2
C261, 465, 504, 611, 752		CEA470M16LS
C319, 321, 854		CEA221M10L2
C351, 352		CEA4R7M35L2
C353, 354, 451, 452		CEA4R7M16NPLL
C355, 356		CEA2R2M50L2
C402		CKSYB392K50
C403		CEAR15M50LS2
C404		CCSCH330J50
C453 – 456		CKPYX332M16L
C457, 458, 612, 701 – 706		CKSYF473Z50
C459, 460		CKPYB121K50L
C467, 468		CEA2R2M50L2
C501, 502		CSYA100M16OS
C506, 710		CKPYY103M16L
C613		CEA471M16L2
C614, 653		CEA470M16L2
C615, 652		CEA470M16LS
C651, 759		CEA100M16LS
C707, 708, 758		CEA220M16LS
C709		CEAR68M50LS2
C711		CEA221M16L2
C713, 751, 853		CKSYF473Z50
C753		CCSCH090D50
C754, 855, 856		CKPYB102K50L
C755		CKPYB271K50L

Main Amp Unit

Main Amp Unit	Model
CWH1019	KEH-8030SDK/WG
CWH1020	KEH-8030/EW KEH-8020/ES
CWH1023	KEH-8020/US, CS

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC551, 552	TA7270P
★★	Q455 (KEH-8030SDK/WG)	2SD1468S or 2SD1012
★★	Q457 — 460	2SC2458 or 2SC536SP
★★	Q601, 603 — 605 (KEH-8030SDK/WG)	2SC2458 or 2SC536SP
★★	Q601, 603 — 605 (KEH-8030/EW, 8020/US, CS, ES)	2SC2458
★★	Q602	2SB941
★★	Q661, 662	2SD1468S or 2SD1012
★	D601, 605	ERA15-02VH or SM-1A-02LFD
★	D602, 604	US1040M or 1SS133 or 1SS176
★	D603	RD6R2ESB2 or HZS6R2EB2 CSR-051
	RL601 Relay	
★★	S551 Switch (LOUDNESS) VR453/S453 Volume/Switch Volume, 20k Ω (B), 50k Ω (W), 20k Ω (W) (VOLUME, BALANCE, FADER, POWER)	CSG-207 CCS1014

RESISTORS (KEH-8030SDK/WG)

Mark	Symbol & Description	Part No.
	R471, 472, 477, 479 — 490, 498, 552 — 560, 563, 564, 603 — 605, 607 — 610, 660	RD1/4PS□□□JL
	R473 — 476, 478, 492 — 497, 551, 601, 602, 606, 611, 620, 621, 863, 864	RS1/8S□□□J

RESISTORS (KEH-8030/EW, 8020/US, CS, ES)

Mark	Symbol & Description	Part No.
	R475, 476, 492 — 497, 551, 601, 602, 606, 611, 612, 620, 621, 863, 864	RS1/8S□□□J
	R479 — 490, 498, 552 — 560, 563, 564, 603 — 605, 607 — 610, 660	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C469, 470	CKSYB272K50
	C471, 472	CEAR33M50L2
	C473 — 476	CEA4R7M25L2
	C477	CEA221M10L2
	C551 — 554	CEAUH010M50
	C555, 556, 561, 562, 567 — 570	CEAUH101M10
	C557, 558	CEAUH470M16
	C559, 560	CKSYB223K25
	C563, 564, 607 — 609	CKPYB102K50L
	C565, 566	CKPYX222M16L
	C571, 572, 575, 576	CQFA224J50L
	C573, 574	CQMA104K50L
	C577, 578 2200 μ F/16V	CCH1001
	C601, 603, 610	CKSYF473Z50
	C602	CEA100M25L2
	C604	CEA470M16L2
	C605	CEA220M16L2
	C606	CEA221M10L2
	C616	CEA102M16L2

FM Unit (CWE1019)

FM Unit	Model
CWE1019	KEH-8030SDK/WG

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC51	LA1140B
★★	IC101	KHA115
★★	IC151	MX3S400
★★	IC801	KHA132
★★	IC802	TA75558S
★★	Q51, 53, 801	2SC2458 or 2SC1740S
★	D151	US1040M or 1SS133 or 1SS176
	T51 Coil	CTC-198
	T801 Coil	CTF-125
	L51 Ferri-Inductor, 15 μ H	CTF1013
	CF51 FM Ceramic Filter	CTF-182
★★	VR101 Semi-fixed, 15k Ω (B)	CCP-246
★★	VR51, 151 Semi-fixed, 150k Ω (B)	CCP-252
★★	VR152, 801 Semi-fixed, 15k Ω (B)	CCP-323
★★	X801 X'tal, 456kHz	CSS1002

RESISTORS

Mark	Symbol & Description	Part No.
	R51 — 53, 55, 56, 59, 102, 103, 804, 806, 807	RD1/4PS□□□JL
	R57, 58, 60 — 62, 65, 101, 801 — 803, 805, 808, 817	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C51	CKSYB223K25
	C52 — 54, 59	CKSYF473Z50
	C55, 62	CCSSL330J50
	C56, 63	CEAR47M50L2
	C57, 812	CKSYB103K50
	C58	CEA010M50L2
	C60	CCSSL101J50
	C64	CEA4R7M16NPLL
	C103, 801, 802	CEA470M16LS
	C105, 161	CEA470M16L2
	C152	CKSYB332K50
	C154	CKSYB153K50
	C803	CEAR47M50LS2
	C804	CKSYB102K50
	C805	CQEA683J50
	C806	CCSCH102J50
	C808	CEANLR33M50LL
	C809	CEA220M16LS

FM Unit (CWE1021)

FM Unit	Model
CWE1020	KEH-8030/EW KEH-8020/ES
CWE1021	KEH-8020/US, CS

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC51	LA1140B
★★	IC101	KHA115
★★	IC151	MX3S400
★★	Q51, 53 (KEH-8030/EW)	2SC2458 or 2SC1740S
★★	Q51 — 53 (KEH-8020/US, CS, ES)	2SC2458 or 2SC1740S
★	D151	US1040M or 1SS133 or 1SS176
	T51 Coil	CTC-198
	L51 Ferri-Inductor, 15μH	CTF1013
	CF51 FM Ceramic Filter (KEH-8030/EW)	CTF-182
	CF51 FM Ceramic Filter	CTF-101
	(KEH-8020/US, CS, ES)	
★★	VR51 Semi-fixed, 330kΩ (B) (KEH-8020/US, CS)	CCP-254
★★	VR101, Semi-fixed, 15kΩ (B)	CCP-246
★★	VR151 Semi-fixed, 150kΩ (B)	CCP-252
★★	VR152 Semi-fixed, 15kΩ (B)	CCP-323

RESISTORS

Mark	Symbol & Description	Part No.
	R51 — 53, 55, 56, 59, 102, 103	RD1/4PS□□□JL
	R54, 57, 58, 60 — 62, 65, 101	RS1/8S□□□J
	R156, 157 (KEH-8020/US, CS, ES)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C51	CKSYB223K25
	C52 — 54, 59	CKSYF473Z50
	C55, 62	CCSSL330J50
	C56, 63	CEAR47M50L2
	C57	CKSYB103K50
	C58	CEA010M50L2
	C60	CCSSL101J50
	C64	CEA4R7M16NPLL
	C103	CEA470M16LS
	C105, 161	CEA470M16L2
	C152	CKSYB332K50
	C154	CKSYB153K50

Switch Unit

Mark	Symbol & Description	Part No.
★★	IC901	PD4078C
★★	Q901 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LG or 2SC2712-LL or 2SC2712-LY UN2216 or DTC143TK MA151K
★★	Q902 — 907	
★	D901 — 903 Chip Diode	MA151A
★	D904 Chip Diode (KEH-8030SDK/WG)	SLR-320MT3
★	D911 — 916 LED	CEL1013
★★	IL901 — 903 Lamp, 14V 40mA	CEL1010
★★	IL904, 905 Lamp, 14V 40mA	
★	LCD	CAW1002
★★	S901 — 907, 909 — 919 Switch	CSG-253
★★	S908 Switch (SDK) (KEH-8030SDK/WG) Switch (CLOCK) (KEH-8020/US, CS, ES)	CSG-253
	X901 X'tal, 32.768kHz (KEH-8030SDK/WG)	CSS1010

REISSTORS

Mark	Symbol & Description	Part No.
	R901 — 904, 906, 907, 911 — 916, 919, 928 — 931, 936, 938, 941, 943, 944, 947, 948	RS1/8S□□□J
	R927, 932, 933, 935 (KEH-8030SDK/WG)	RS1/8S□□□J
	R934, 950 (KEH-8030/EW, 8020/US, CS, ES)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C901	CKSYB102K50
	C902	CCSCH330J50
	C903	CKSYF473Z50
	C904 (KEH-8030SDK/WG)	CCSCH330J50
	C905 (KEH-8030SDK/WG)	CCSCH220J50

PROTECTIVE CIRCUIT UNIT (CWM1191)

Mark	Symbol & Description	Part No.
★★	Q1	2SB1066MF
★★	Q2	2SA1048 or 2SA608SP
★★	Q3, 4	2SC2021F
★★	Q5	2SC1740S or 2SC2458
★	D1, 2, 4	US1040M or 1SS133 or 1SS176
★	D3	RD22JSB2 or HZS22JB2

RESISTORS

Mark	Symbol & Description	Part No.
	R1	CCN1007
	R2	CCN1008
	R3, 4, 7 - 15	RD1/4PS □□□JL
	R5	RN1P □□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 3	CEA470M16L2
	C2	CEA220M16L2
	C4	CKPYY103M16L

Switch P.C. Board

Mark	Symbol & Description	Part No.
★★	S1 Switch (CST SET)	CSN-089
★★	S2, 3 Switch (CST IN, 70μS)	CSN-091
★	MR1, 2 Magnetic Resistive Device	SDME106A

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1, 2	1S1555

Miscellaneous Part List

Mark	Symbol & Description	Part No.
★★	Head Unit	CXA1123
★★	M1 Motor (Head)	CXM-452
★★	M2 Motor (Gear)	CXM-351
★★	M3 Motor (Capstan)	CXM1007

22. PACKING METHOD

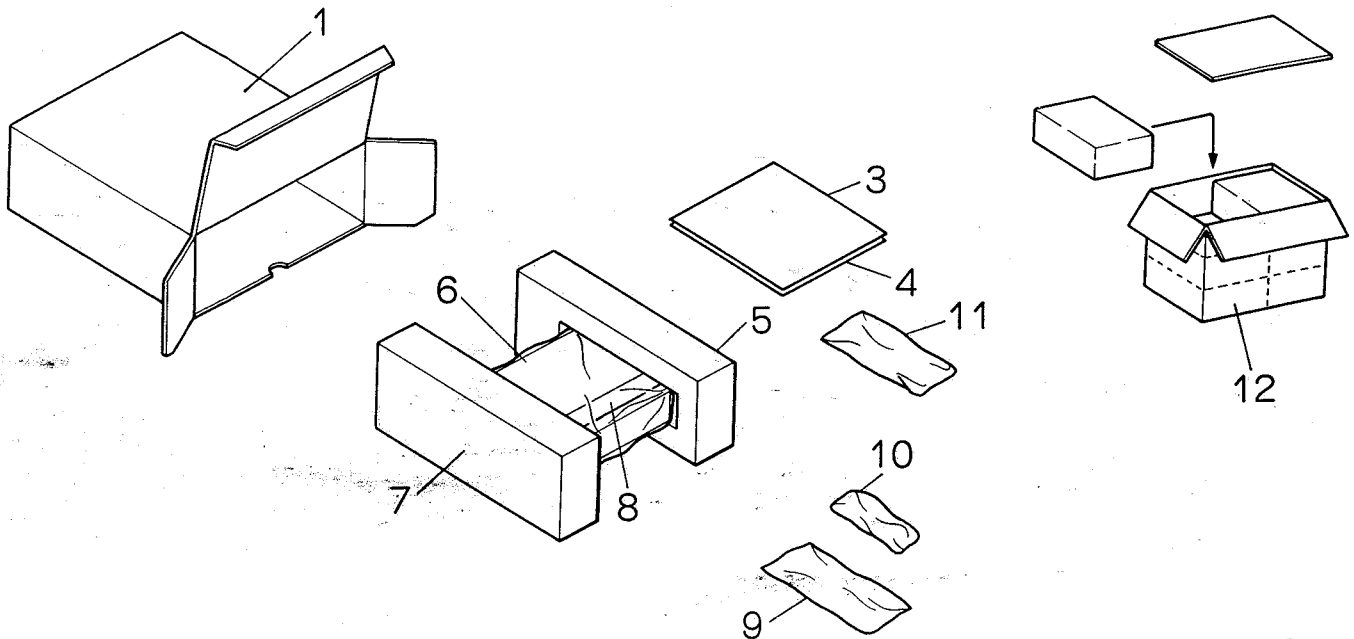


Fig. 53

• Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CHG1124	Carton (KEH-8030/EW)		7.	CHP1034	Styroform
		CHG1125	Carton (KEH-8030SDK/WG)		8.	CNH-119	Holder
		CHG1127	Carton (KEH-8020/US)		9.	CEA1076	Accessory Kit
		CHG1128	Carton (KEH-8020/ES)		9-1.	CBA1002	Screw
		CHG1129	Carton (KEH-8020/CS)		9-2.	CDE-437	Cord
	2.	VACANT			9-3.	CNF-111	Strap
	3.	CRB1023	Owner's Manual (KEH-8020/US) (English)		9-4.	CNF-382	Lever
		CRD1026	Owner's Manual (KEH-8020/CS) (English, Spanish)		9-5.	CNV1009	Bush
		CRD1027	Owner's Manual (KEH-8030SDK/WG) (French, German)		9-6.		Screw Kit
		CRD1028	Owner's Manual (KEH-8030/EW) (English, French, German, Spanish)		9-6-1.	CBA-028	Screw for strap
		CRD1069	Owner's Manual (KEH-8020/ES) (English, French, Spanish, Arabic)		9-6-2.	NF40FMC	Nut
					9-6-3.	NF50FMC	Nut
	4.	CRD1029	Owner's Manual (KEH-8030/EW) (Swedish, Norwegian, Dutch)		9-6-4.	PMB50Y160FMC	Screw
	5.	CHP1035	Styroform		9-6-5.	WS40FMC	Washer
	6.	CEG-114	Cover		10.	CDE1278	Cord Assy (KEH-8030SDK/WG)
						CDE1279	Cord Assy (KEH-8030/EW, 8020/US, CS, ES)
					11.	CHL1127	Contain Box (KEH-8020/US)

